

SEQUENCE LISTING

<110> Seishi Kato and Tomoko Kimura

<120> HUMAN PROTEINS HAVING HYDROPHOBIC DOMAINS AND HAVING ENDED THESE PROTEINS

<130> GIN-67070008

<150> JP 10-326255

<151> 1998-11-17

<150> JP 10-364315

<151> 1998-12-22

<150> JP 11-69811

<151> 1999-03-16

<150> JP 11-114094

<151> 1999-04-17

<150> JP 11-138164

<151> 1999-05-17

<160> 150

<170> 1

<181> 647

<182> PRT

<210> Homo sapiens

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Glu Gly Ser Gly Asp Ala Gly Gly Arg Arg Arg Arg Leu Val Ala Leu
45 50 55 60
Arg Arg Leu Ala Arg Glu Leu Leu Leu Leu Leu Leu Leu Leu Leu Leu Leu
65 70 75 80 85 90 95
Pro Leu Leu Leu Gly Val Arg Ala Glu Ala Ala Gly Glu Gly Leu Gly
100 105 110 115 120 125 130 135 140
Glu Gly Pro Gly Pro Gly Glu Glu Ser Ser Ser Ser Ser Ser Ser Ser
145 150 155 160 165 170 175 180 185 190
Glu Ser Gly Glu Glu Tyr Asn Gly Glu Arg Gly Glu Ser Val Pro Arg
195 200 205 210 215 220 225 230 235 240
His Gly Tyr Tyr Glu Ser Ile Ser Ile Ser Ile Ser Tyr Thr Ser Thr Ala
245 250 255 260 265 270 275 280 285 290
Tyr Asn Glu Thr Ile Met Pro Asn Leu Leu Gly His Thr Asn Thr Glu
295 300 305 310 315 320 325 330 335 340
Asp Ala Gly Leu Glu Val His Glu Phe Tyr Pro Leu Val Cys Val Ala
345 350 355 360 365 370 375 380 385 390
Cys Ser Ala Glu Leu Lys Phe Phe Leu Cys Ser Met Tyr Ala Ser Val
395 400 405 410 415 420 425 430 435 440
Cys Thr Val Leu Glu Glu Ala Leu Pro Pro Cys Arg Ser Leu Tyr Glu
445 450 455 460 465 470 475 480 485 490
Arg Ala Arg Glu Gly Tyr Glu Ala Leu Met Asn Lys Phe Gly Thr Ala
495 500 505 510 515 520 525 530 535 540
Trp Pro Asp Thr Leu Lys Cys Glu Lys Ser Ser Thr His Ala Ala Gly
545 550 555 560 565 570 575 580 585 590
Glu Leu Cys Val Arg Glu Asn Thr Ser Arg Lys Gly Thr Ser Thr Leu

Glu Leu Cys Val Gly Glu Asn Thr Ser Asp Lys Gly Thr Pro Thr Pro
 335 334 337 34
 Ser Leu Leu Pro His Phe Trp Thr Ser Asp Pro Glu His Gly Gly Gly
 345 347 346
 Gly His Arg Gly Gly Phe Pro Gly Gly Ala Gly Ala Ser Glu Arg Gly
 360 363 364
 Lys Phe Ser Cys Pro Arg Ala Leu Lys Val Pro Ser Tyr Leu Asn Tyr
 371 377 378
 His Phe Leu Gly Glu Lys Asp Cys Gly Ala Pro Cys Glu Pro Thr Lys
 384 395 399
 Val Tyr Gly Leu Met Tyr Phe Gly Pro Glu Glu Leu Arg His Ser Arg
 395 399 405 407
 Thr Trp Ile Gly Ile Trp Ser Val Leu Cys Cys Ala Ser Thr Leu Phe
 420 421 437
 Thr Val Leu Thr Tyr Leu Val Asp Met Arg Arg Phe Ser Tyr Pro His
 342 441 442
 Arg Pro Ile Ile Phe Leu Ser Gly Cys Tyr Thr Ala Val Arg Val Ala
 443 447 450
 Tyr Ile Ala Gly Phe Leu Leu His Asp Arg Val Val Tyr Ser Asp Lys
 457 457 459
 His Ala His Asp Gly Ala Arg Thr Val Ala His Gly Thr Lys Lys Glu
 461 467 474
 Gly Lys Thr Ile Leu His Met Met Leu Tyr Phe His Ser Met Ala Ser
 475 477 486
 Ser Ile Trp Trp Val Ile Leu Ser Leu Thr Arg His Leu Ala Ala Gly
 487 490 491
 Met Asp Thr Gly His His Ala Ile Ala Ala Arg Ser Arg Tyr His His
 497 507 511
 Leu Ala Ala Trp Ala Val Pro Ala Ile Lys Thr Ile Thr Ile Leu Ala
 497 500 503
 Leu Gly His Val Asp Gly Asp Val Leu Ser Gly Val Tyr Ile Val Gly
 505 507 511 512
 Leu Asn Asn Val Asp Ala Leu Arg Gly Phe Val Leu Ala Ile Leu His
 515 517 520
 Val Tyr Leu His Ile Gly Thr Ser His Leu Leu Ala Gly His Val Ser
 521 523 529
 Leu His Arg His Arg Thr Ile Met Lys His Asp Gly Thr Ile His Glu
 527 530 534
 Asp Leu His Lys Leu Met Val Arg Ile Gly Val Phe Ser Val Ile Lys
 534 538 541
 Thr Val His Ala Thr Ile Val Ile Ala Tyr Lys His Lys Arg His Glu
 545 547 550
 Phe Arg Asp His Tyr His Arg Ser Thr Val Ala His Ser Thr Lys Ser
 557 560 563
 Tyr Ala Ile Arg Tyr Ile His Leu His Ala Gly Gly Gly Arg Ile
 561 564 567
 His Pro Pro Met Ser His Asp His Thr Val His Met Ile Lys Lys Leu
 567 570 573
 Met Thr Leu Ile Val Gly Ile His Ser Gly His Tyr Ile Lys Ser Gly
 577 581 584
 Lys Thr Leu Asn Ser Trp Arg Lys His Tyr Thr Arg Ile Thr Asn Ser
 628 631 635 641
 Lys Glu Gly Glu Thr Thr Val
 648

0011-4
 0011-4
 0012-187
 0012-187

Met His Ile Ala Ala Phe Pro Leu Pro Val Val Val Ala Ala Val Leu
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 Trp Gly Ala Ala Pro Thr Arg Gly Leu Ile Arg Ala Thr Ser Asp His
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
 Asn Ala Ser Met Asp Phe Ala Asp Leu Pro Ala Leu Ile Gly Ala Thr
 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
 Leu Ser Gln Gln Gly Leu Gln Gly Phe Leu Val Gln Ala His Pro Arg
 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
 Asn Ala Tyr Ser Pro Ile Ala Pro Pro Pro Pro Ala Pro Val Asn Gly
 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
 Ser Val Phe Ile Ala Leu Leu Arg Arg Phe Asp Cys Asn Phe Asp Leu
 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120
 Lys Val Leu Asn Ala Gln Lys Ala Gly Tyr Gly Ala Ala Val Val His
 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140
 Asn Val Asn Ser Asn Gln Leu Leu Asn Met Val Trp Asn Ser Thr Ala
 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160
 Ile His Gln Asn Ile Thr Ile Pro Ser Val Phe Ile Gly His Arg Ser
 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180
 Ser His Tyr Leu Arg Ala Leu Phe Val Tyr His Lys Gly Ala Arg Val
 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200
 Leu Leu Val Ser Asp Thr Thr Pro Leu Gly Tyr Tyr Leu Ile Pro
 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220
 His Thr Gly Leu Val Gly Leu Leu Val Leu Ala Met Gly Ala Val Met
 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240
 Ile Ala Arg Tyr Ile Gln His Arg Lys Arg Leu His Arg Asn Arg Leu
 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260
 Ser Tyr His His Leu Lys Gln Ile Pro Thr His Asp Tyr His Lys Gly
 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280
 Asp His Tyr Asp Val Tyr Ala Ile Tyr Leu Asp His Tyr His Asp Gly
 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300
 Asp Lys Leu Arg Val Leu Pro Cys Ala His Ala Tyr His Ser Arg Cys
 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320
 Val Asp Pro Trp Leu Thr Gln Thr Arg Lys Thr Cys Pro Ile Tyr Lys
 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340
 His Pro Val His Arg Gly Pro Gly Asp Gln Asp His Gln His His Thr
 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360
 Gln Gly His Val His Gly Asp Gln Gly His His Arg Asp His His Ala
 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380
 Ser His Asp Thr Thr Leu Leu Gly Ser Ser His Thr Leu Thr Thr Ser
 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
 His Gly Ser Leu Ala His Ala His Leu Val His His Gly His Thr Thr
 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420
 Asp Pro Pro Leu Ser Pro Pro Ser Ser Pro Val Ile Leu Val
 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440

441-442
 443-444
 445-446
 447-448

449-450
 Met Gly Leu Gly Gln Pro Gln Ala Tyr Leu Leu Gly Leu Thr Ala
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 Val Val Tyr Gly Ser Leu Ala Leu Phe Thr Thr Ile Leu His Asn Val
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
 His Leu Leu Tyr Tyr Val Asp Thr Phe Val Ser Val Tyr Cys Ile Asn
 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
 Tyr Met Ala Phe Thr Val Gly Gln Thr Val His Leu Leu Tyr Asn Ser
 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
 Leu Asn Arg Leu Leu Pro Gly Thr Leu Ser Arg Asn Gln His Leu Ser
 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Ser His Pro Arg Gly Arg Asp Leu Pro Trp Leu Gly Leu Val His Pro
 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

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 Phe Leu Gly Val Gly Leu Trp Ala Trp Ser Ala Lys Gly Val Leu Ser
 Asp Leu Thr Lys Val Thr Arg Met His Gly Ile Asp Trp Val Val Leu
 Val Leu Met Val Gly Val Val Met Phe Thr Leu Gly Ile Ala Gly Cys
 Val Gly Ala Leu Arg Glu Asn Ile Cys Leu Leu Asn Ile Asn Ala Cys
 Cys Gly Ala Tyr Gly Pro Ala Asp Thr Asp Leu Asn Val Tyr Ile Asn
 Cys Ser Gly Ala Ser Tyr Ser Arg Glu Lys Tyr Gly Val Ile Ile Ser
 Cys Cys Val Trp Asp Trp Ala His Lys Val Val Asn Ile Ser Tyr Val
 Tyr Asp Val Ala Ile Ala Leu Lys Ser Lys Thr Arg His Ser Ile Ile
 Thr Lys Gly Tyr Ile His Ala Leu Glu Ser Thr Ile Ile Asn Asn Ile
 Tyr Ile Val Ala Gly Val Ile Ile Ala Ile Ser Leu Ile Ile Ile Ile
 Gly Ile Phe Leu Ala Arg Thr Leu Ile Ser Arg Ile Ile Ala Val Tyr
 Ala Gly His His Ile

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 <412> PPT
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<410> 7
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 Gly Trp Thr Ile Ala Ala Gly Val Ala His Ser Trp Ile Ile Ala

10 15
 Glu Asp Leu Gln Gln Asp Ile Gln Asn Ile Gln Glu Thr His Arg Leu
 Tyr Arg Leu Lys Leu Gln Gln Leu Thr Lys Leu Gln Asn Asn Tyr Thr
 Ser Ser Ile Thr Arg Gln Lys Lys Arg Leu Gln Gln Leu Ala Leu Ala
 Leu Lys Lys Cys Lys Pro Ser Leu Pro Ala Glu Ala Glu Gly Ala Ala
 Gln Gln Leu Gln Asn Gln Met Lys Gln Arg Gln Gly Leu Phe Phe Asp
 Met Gln Ala Tyr Leu Pro Lys Lys Asn Gly Leu Tyr Leu Ser Leu Val
 Leu Gly Asn Val Asn Val Thr Leu Leu Ser Lys Gln Ala Lys Phe Ala
 Tyr Lys Asp Gln Tyr Gln Lys Phe Lys Leu Tyr Leu Thr Ile Ile Leu
 Ile Leu Ile Ser Ile Thr Cys Arg Ile Leu Leu Asn Ser Arg Val Thr
 Asp Ala Ala Phe Asn Phe Leu Leu Val Trp Tyr Tyr Cys Thr Leu Thr
 Ile Arg Gln Ser Ile Leu Ile Asn Asn Gly Ser Arg Ile Lys Gly Trp
 Trp Val Phe His His Tyr Val Ser Thr Phe Leu Ser Gly Val Met Leu
 Thr Trp Trp Asp Gly Leu Met Tyr Gln Lys Phe Arg Asn Gln Phe Leu
 Ser Ile Ser Met Tyr Gln Ser Ile Val Gln Ile Leu Gln Tyr Tyr Tyr
 Gln Ser Gly Lys Leu Tyr Arg Leu Arg Ala Leu Gly Gln Arg His Thr
 Met Asp Leu Thr Val Gln Gly Ile Gln Ser Trp Met Trp Arg Gly Leu
 Thr Phe Leu Leu Pro Phe Leu Ile Phe Gly His Phe Trp Gln Leu Phe
 Asn Ala Leu Thr Leu Phe Asn Leu Ala Gln Asp Pro Gln Cys Lys Gln
 Trp Gln Val Leu Met Tyr Gly Ile Pro Phe Leu Leu Leu Ile Leu Gly
 Asn Phe Phe Thr Thr Leu Arg Val Val His His Lys Phe His Ser Gln
 Arg His Gly Ser Lys Lys Asp

6110-1
 6111-144
 6112-187
 6113-875

6433-1
 Met Asp Ile Leu Val Arg Leu Leu Gln Leu Leu Val Leu Leu Thr
 Leu Pro Leu His Leu Met Ala Leu Leu Gly Cys Trp Gln Pro Leu Cys
 Lys Ser Tyr Phe Pro Tyr Leu Met Ala Val Leu Thr Pro Lys Ser Asn
 Arg Lys Met Gln Ser Lys Lys Arg Leu Leu Phe Ser Gln Ile Lys Gly
 Leu Thr Gly Ala Ser Gly Lys Val Ala Leu Leu Gln Leu Gly Tyr Gly
 Thr Gly Ala Ser Ile Gln Ile Tyr Trp Phe Gly Tyr Arg Val Thr Tyr

85 90 95
 Leu Asp Pro Asn Pro His Phe Gln Lys Phe Leu Thr Lys Ser Met Ala
 100 105 110
 Glu Asn Arg His Leu Gln Tyr Glu Arg Phe Val Val Ala Pro Gly Glu
 115 120 125
 Asp Met Arg Gln Leu Ala Asp Gly Ser Met Asp Val Val Val Cys Thr
 130 135 140
 Leu Val Leu Cys Ser Val Gln Ser Pro Arg Lys Val Leu Gln Glu Val
 145 150 155 160
 Arg Arg Val Leu Arg Pro Gly Gly Val Leu Phe Phe Trp Glu His Val
 165 170 175
 Ala Glu Pro Tyr Gly Ser Trp Ala Phe Met Trp Gln Gln Val Phe Glu
 180 185 190
 Pro Thr Trp Lys His Ile Gly Asp Gly Cys Cys Leu Thr Arg Glu Thr
 195 200 205
 Trp Lys Asp Leu Glu Asn Ala Gln Phe Ser Glu Ile Gln Met Glu Arg
 210 215 220
 Gln Pro Pro Pro Leu Lys Trp Leu Pro Val Gly Pro His Ile Met Gly
 225 230 235
 Lys Ala Val Lys

217-4
 217-73
 217-88T
 217-88T (Solutions)

24-1-1
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 Ile Ala Gly Leu Leu Tyr Ala Leu Val Gln Leu Gly Gln Pro Cys Asp
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 Cys Leu Pro Pro Leu Arg Ala Ala Ala Glu Gln Leu Arg Gln Lys Asp
 35 40 45
 Leu Arg Ile Ser Gln Leu Gln Ala Glu Leu Arg Arg Pro Pro Pro Ala
 50 55 60
 Pro Ala Val Pro Pro Gln Pro Glu Ala Leu Pro Thr Ile Tyr Val Val
 65 70 75
 Thr Pro Thr Tyr Ala Arg Pro Leu Trp Val Gln Tyr Pro Gln Asp Val
 80 85 90
 Thr Thr Pro Asp Ile Asp Asp Gln Tyr Leu Leu Gly Asp Ala Leu Leu
 95 100 105
 Val His Pro Val Ser Asp Ser Gly Ala His Gly Val Gln Val Tyr Leu
 110 115 120
 Pro Gly Gln Gly Ala Val Trp Tyr Asp Ile Gln Ser Tyr Gln Lys His
 125 130 135 140
 His Gly Pro Gln Thr Leu Tyr Leu Pro Val Thr Leu Leu Ser Leu Leu
 145 150 155 160
 Val Phe Gln Arg Gly Gly Thr Ile Val Pro Arg Trp Met Arg Val Arg
 165 170 175
 Arg Ser Ser Glu Cys Met Lys Asp Asp Pro Ile Thr Leu Pro Val Ala
 180 185 190
 Leu Ser Pro Gln Gly Thr Ala Gln Gly Glu Leu Phe Leu Asp Asp Gly
 195 200 205
 His Thr Phe Asn Tyr Gln Thr Arg Gln Gln Phe Leu Leu Arg Arg Ile
 210 215 220
 Ser Ile Ser Gly Asn Thr Leu Val Ser Ser Ser Ala Asp Thr Glu Gly
 225 230 235 240
 His Ile Glu Thr Pro Ile Tyr Ile Gln Arg Val Val Ile Glu Gly Ala
 245 250 255
 Gly Lys Pro Ala Ala Val Val Ser Glu Thr Lys Gly Ser Pro Glu Ser

qaaqaaqaaq	caagatattt	taacatgac	aatgagga	tggagagaa	caaaagaa	1387
aaacacag	caatgagaa	gagagaggg	aagatgga	gagagatga	atgagagga	1444
cttaaacag	tggagagat	gaatgattt	gagagagga	taattattt	gaaatattt	1470
atgggaag	atttttggat	ggcaggattt	gtgatgat	tatgaaag	caacataat	1560
aaagagatg	aaacagaa	cgagagatg	gagagatga	tggagagaa	tggagagaa	1607
aggggggg	aaatgggac	agacacata	gaaatgga	aaatattata	cgagaggg	1680
ttagggac	agtggaa	caatgggtg	gaaagagat	aaagagga	aggaatgaa	1740
tgaactaac	ttaggggg	cgagagggc	cgagagaa	agacataa	agagagatt	1800
aaatattat	gaatgaat	attatgag	atgagag	gaatcagat	aaatattat	1860
aatgggac	gaagagaa	caatcctgg	aaagattt	aaagagat	gaatgaat	1920
aaagaaat	aaatcaat	c				1944

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• 2.2.1	2.1
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• 2.2.3	2.2.3
• 2.2.4	2.2.4

1000

110	115	120	125	
agt ggg gaa atc cag cag gag atc tgg atc cag cct gga ttt gtt gtt				67
Ser Glu Glu Ile Gln Gln Gln Ile Trp Ile Pro Ser Val Phe Ile Gly				
130	135	140		
gag aag aag ttc gag ttc ctg agt ggt ggt ttt gtc taa taa aag aag				68
Glu Arg Ser Ser Glu Tyr Leu Arg Ala Leu Phe Val Tyr Glu Lys Gly				
145	150	155		
ggt ggt ggt ggt ctg gtt gaa gag aat aac ttc cct ttt ggt ttt ggt				69
Ala Arg Val Leu Leu Val Pro Asp Asn Thr Phe Pro Leu Gly Tyr Tyr				
160	165	170		
ctc atc cct ttc aca ggg att ctg gga ctg ctg gtt ttt gag atg gtt				70
Leu Ile Pro Phe Thr Gly Ile Val Gly Leu Leu Val Leu Ala Met Gly				
175	180	185		
gaa gaa aat ata ggt ggt tgt atc cag cag agt aag cag ggt aag ggt				71
Ala Val Met Ile Ala Arg Lys Ile Gln His Arg Lys Arg Leu Gln Arg				
190	195	200		
aat gga gtt acc aag aag gag aag ctg aag aag att cct aag ttt ggt ttt				72
Asn Arg Leu Thr Lys Glu Gln Leu Lys Gln Ile Pro Thr His Asp Tyr				
205	210	215		
cag aat ttt aac aat ttt gag ggt ttt ggt att tgc ttt ttt aag ttt				73
Gln Lys Gly Asp Gln Tyr Asp Val Tyr Ala Ile Tyr Leu Arg His Tyr				
220	225	230		
gag ttt ttt aac aag ttt ttt ata ggt ggt ttt ggt ggt ttt ttt ttt				74
Glu Asp Gly Asp Lys Leu Arg Val Leu Pro Lys Ala His Ala Tyr His				
235	240	245		
aag ttt ttt ttt gag aag ttt ttt ctg aat ttt ggt aat agg ttt ttt ttt				75
Ser Arg Lys Val Asp Pro Trp Leu Thr Gln Thr Arg Lys Thr Tyr Trp				
250	255	260		
att ttt ttt gag ggt ttt ttt gag ggt ttt ttt aat ttt ttt ttt ggt				76
Ile Tyr Lys Gln Pro Val His Arg Gly Pro Gly Asp Arg Arg Gln Gly				
265	270	275		
gaa gaa aat aag ggg aag aag gag ggt ttt aag ggg gag ttt aag gag				77
Glu Glu Thr Gln Gly Gln Gln Gln Gly Asp Glu Gly Glu Pro Arg Asp				
280	285	290		
aac ggt ggt aag aag aag aag ggt ttt ggt ttt ggt ttt ggt ttt ggt				78
His Pro Ala Ser Glu Arg Thr Pro Leu Leu Gly Ser Ser Pro Leu Leu				
295	300	305		
gaa ggt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				79
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
310	315	320		
ggt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				80
Pro Ser Thr Asp Pro Pro Leu Ser Pro Pro Ser Ser Pro Val Ile Leu				
325	330	335		
ggt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				81
Val				
340	345	350		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				82
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
355	360	365		
ggt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				83
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
370	375	380		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				84
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
385	390	395		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				85
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
400	405	410		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				86
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
415	420	425		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				87
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
430	435	440		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				88
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
445	450	455		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				89
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
460	465	470		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				90
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
475	480	485		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				91
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
490	495	500		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				92
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
505	510	515		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				93
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
520	525	530		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				94
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
535	540	545		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				95
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
550	555	560		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				96
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
565	570	575		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				97
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
580	585	590		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				98
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
595	600	605		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				99
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				
610	615	620		
tgt ttt ttt gag ggt ttt ttt aag aag ggt ggt ggt ttt ttt ttt ggt				100
Pro Thr Ser Ile Gly Ser Leu Ala Ser Ala Pro Leu Val Leu Leu Gly				

<210> 24
 <211> 1019
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> 1019-1019

<4> 1019
 <401> 1019-1019

[illegible]

12215 (107-111-1501)

140-16

gggtgggag ctgagcgcgc ggaatg atg atg ggc taa ggc aac aac aac aac 13
Met Val Ala Ser Ala Lys Met Gly Arg
1 5
aca ggg aac atg atg gtc taa gaa gaa gaa gaa gaa gaa gaa gaa 141
Ala Gly Thr Met Ala Val Ala Ala Glu Leu Arg Glu Leu Cys Phe Gly
17 15 20 25
atg aac aac atg aac taa atc taa gag agt ggt aac tga taa gaa gaa 149
Val Asn Asn Val Pro Tyr Leu Cys Glu Ser Gly His Cys Cys Gly Glu
30 35 40
act aac tga tga aac taa taa tat gaa atc tgg tgg ttc tga atc atc 157
Thr Gly Cys Cys Thr Tyr Tyr Tyr Glu Leu Trp Trp Phe Trp Leu Leu
45 50 55
taa act gtc taa aac taa taa taa taa taa taa taa taa taa taa taa 165
Trp Thr Val Leu Ile Leu Phe Ser Cys Cys Cys Ala Phe Arg His Arg
60 65 70
aga act aac taa ggt ggt ggt ggt ggt ggt ggt ggt ggt ggt ggt ggt 173
Arg Ala Lys Leu Arg Leu Val Val Val Val Val Val Val Val Val Val
75 80 85
tgg tgg tgg taa taa taa taa taa taa taa taa taa taa taa taa taa 181
Leu Leu Ala Tyr His Gly Ala Cys His Gly Ala Gly Phe Phe Phe Thr
90 95 100
atg taa atg atc aac taa taa taa taa taa taa taa taa taa taa taa 189
Gly Ser Leu Leu Asp Leu Arg Ile Leu Ser Thr Phe Lys Phe Phe Ala
105 110 115
aac atg atg atc atc taa taa taa taa taa taa taa taa taa taa taa 197
Tyr His Asp Val Val His Arg Ile Gly Thr Phe Phe Phe Ile Tyr Thr
120 125 130
atg taa taa taa taa taa taa taa taa taa taa taa taa taa taa taa 205
Val Ala Pro Gly Arg Pro Leu Thr Ala Ser Ser Glu Glu Thr Cys Cys
140 145 150
aac taa taa taa taa taa taa taa taa taa taa taa taa taa taa taa 213
Ser Ser Ser Ser Ser Cys Pro Ala His Ile Glu Gly Thr Asn Val Gly
155 160 165
agt atc taa taa taa taa taa taa taa taa taa taa taa taa taa taa 221
Gly Val Ser Ser His Val Ser Ala Phe Phe His Val Glu Gly Phe Phe
170 175 180
atg taa taa taa taa taa taa taa taa taa taa taa taa taa taa taa 229
Gly Ala Gly Val Thr Ser Ala Ser Thr Phe Phe Ser Cys Asn Thr Asn
185 190 195
agt taa act gga taa taa taa taa taa taa taa taa taa taa taa taa 237
Arg Leu Thr Gly Asp Ser Gly Ile Glu Leu Cys Pro Cys Phe Ala Ser
200 205 210
atc atc atc atc atc taa taa taa taa taa taa taa taa taa taa taa 245
Gly His Gly His Ile Val Lys His Val Asn Val Ser Ala Thr Leu Phe
215 220 225
atc atc atc atc atc taa taa taa taa taa taa taa taa taa taa taa 253
Asp Leu Glu Asp Tyr Ser Pro Cys Ala Leu Phe Phe Gly Ser Val Phe
230 235 240
aac atc taa taa atc ggg atg atg atc taa atc gaa gaa gaa atc taa 261
Glu Ile Phe Pro Met Gly Leu Ser Ser Ser Gly Asp Ile Pro
245 250 255
ta aataatatt adaggggga tgggttaatt tggatagga aagagacata 269
tggatagga aagagacata tggatagga aagagacata tggatagga aagagacata 277
tggatagga aagagacata tggatagga aagagacata tggatagga aagagacata 285
tggatagga aagagacata tggatagga aagagacata tggatagga aagagacata 293

12215 (107-111-1501)
12215 (107-111-1501)

<112> RNA
 <112> Homo sapiens

<122>
 <122> (12)
 <122> (24)...(1050)

<4018> 27

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Met Gln Pro Pro Pro Pro Gly Pro Leu Gly				
gag tgc atg cgg gac tgg gag gat cta gag gag gac tta gag aat atc	15	20	25	
Asp Cys Leu Arg Asp Tyr Glu Asp Leu Gln Asp Phe Gln Asp Ile				
gag gag aac cat cgg cta tac cca atg gag cta gag gac tgc aac aac	30	35	40	
Phe Gln Thr His Arg Leu Tyr Arg Leu Lys Leu Gln Gln Leu Thr Lys				
atg gag aac aac tgc aac agc tcc atc cca cca cca cca cca cca cca	45	50		
Leu Gln Asp Asp Lys Thr Ser Ser Ile Thr Arg Gln Lys Lys Arg Leu				
gag gag atg gag cta tac atg aac aac tta aac cca tta cca cca cca	55	60		
Gln Gln Leu Ala Leu Ala Leu Lys Lys Cys Lys Arg Ser Leu Arg Ala				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	65	70	75	80
Gln Ala Gln Gly Ala Ala Gln Gln Leu Gln Asp Gln Met Lys Gln Arg				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	85	90	95	100
Gln Gly Leu Phe Phe Asp Met Gln Ala Tyr Leu Arg Lys Lys Asp Gly				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	105	110	115	120
Leu Tyr Leu Ser Leu Val Leu Gly Asp Val Asp Val Thr Leu Leu Ser				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	125	130	135	140
Lys Gln Ala Lys Phe Ala Tyr Lys Asp Gln Tyr Gln Lys Phe Lys Leu				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	145	150	155	160
Tyr Gln Thr Ile Ile Leu Ile Leu Ile Ser Phe Thr Tyr Arg Ile Leu				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	165	170	175	180
Leu Asp Ser Arg Val Thr Asp Ala Ala Phe Asp Phe Leu Leu Val Tyr				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	185	190	195	200
Tyr Tyr Lys Thr Leu Thr Ile Arg Gln Ser Ile Leu Leu Asp Asp Gly				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	205	210	215	220
Ser Arg Ile Lys Gly Trp Trp Val Phe Gly Gly Tyr Val Ser Thr Phe				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	225	230	235	240
Leu Ser Gly Val Met Leu Thr Tyr Pro Arg Gly Leu Met Lys Gln Lys				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	245	250	255	260
Phe Arg Asp Gln Phe Leu Ser Phe Ser Met Tyr Gln Ser Phe Val Gln				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	265	270	275	280
Phe Leu Gln Tyr Tyr Tyr Gln Ser Gly Cys Leu Tyr Arg Leu Arg Ala				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	285	290	295	300
Leu Gly Gln Arg His Thr Met Arg Leu Thr Val Gln Gly Phe Gln Ser				
gag gag aac cca ttc tta gag gag gag gag gag gag gag gag gag gag	305	310	315	320
Tyr Met Tyr Arg Gly Leu Thr Thr Leu Thr Thr Thr Thr Thr Thr Gly				

Table 1. *Salmonella* serotypes and phage types isolated from the 1997-1998 salmonellosis outbreak in the Netherlands

100					105					110					
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	4-7
Tyr	Tyr	Asp	Ile	Gln	Ser	Tyr	Gln	Lys	His	His	Gly	Pro	Gln	Thr	Leu
116				140					145					150	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	155
Tyr	Leu	Pro	Val	Thr	Leu	Ser	Ser	Ile	Pro	Val	Ile	Gln	Arg	Gly	Gly
				165					160					165	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	170
Thr	Ile	Val	Pro	Arg	Trp	Met	Arg	Val	Arg	Arg	Ser	Ser	Gln	Cys	Met
				170					175					180	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	185
Lys	Asp	Asp	Pro	Ile	Thr	Leu	Phe	Val	Ala	Leu	Ser	Pro	Gln	Gly	Thr
				185					190					195	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	200
Ala	Gln	Gly	Gln	Leu	Ile	Leu	Asp	Asp	Gly	His	Thr	Phe	Asn	Tyr	Gln
				200											
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	205
Thr	Arg	Gln	Gln	Phe	Leu	Leu	Arg	Arg	Phe	Ser	Ile	Ser	Gly	Asn	Thr
				210					215					220	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	225
Leu	Val	Ser	Ser	Ser	Ala	Asp	Pro	Gln	Gly	His	Ile	Gln	Thr	Pro	Ile
				230					235					240	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	245
Trp	Ile	Gln	Arg	Val	Val	Ile	Ile	Gly	Ala	Gly	Lys	Trp	Ala	Ala	Val
				250					255					260	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	265
Val	Leu	Gln	Thr	Lys	Gly	Ser	Pro	Gln	Ser	Arg	Leu	Ser	Phe	Gln	His
				270					275					280	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	285
Asp	Pro	Val	Thr	Ser	Val	Leu	Val	Leu	Arg	Lys	Pro	Gly	Ile	Asn	Val
				290					295					300	
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	305
Ala	Ser	Asp	Trp	Ser	Ile	His	Leu	Arg							
				310											
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	315
Ala	Ser	Asp	Trp	Ser	Ile	His	Leu	Arg							
				320											
101	102	103	104	105											

210	31	
211	1114	
212	214	
213	11	1114

gaggggggg gggggggg gggggggg gggggggg gggggggg gggggggg gggggggg gggggggg
gagggggg ga ag gga gag gga gga gag gga gga gga gga gga gga gga gga gga
Met Asp Lys Leu Lys Lys Val LeuSer Gly Glu Arg Thr

Tgg Aat Aag Aag Aaa Ggc Ttc Att Ggg Tgt Ttt Ggt Aaa Aaa Att
 Trp Ser Thr Arg Ile Lys Gly Phe Ile Ala Cys Phe Ala Ile Gly His
 10 35 40 45

cgc tgc tca atg atg ggt act gtt ctg ctg tgg gtg gcc agc aag gga
 Leu Cys Ser Leu Leu Gly Thr Val Leu Leu Trp Val Pro Arg Lys Gly
 60 90

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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add add add add The One and Two One and Two One and
My Six The One One One One One One One One One One

+0 +0 +0

The gas left after the dry air was sent through soda lime
Pne Sil Pne The Arg Linc The Ala Fly The Met The Ind Ind Nye The

(6) (7)

Glu 111 Asp 112 Thr 113 Ser 114 Trp 115 Met 116 Arg 117 Ala 118 Glu
Ala 119 Thr 120 Cys 121 Ser 122 Phe 123 Trp 124 Trp 125 His 126 Asn 127 Lys 128 Gly 129 Ala
110 115 120 125

Ala Ile Val Met Leu Phe Val Ser Thr Leu Thr Arg Thr Thr Thr Thr Thr
 Leu Ile Phe Cys Ile Met Gin Ser Leu Ala Leu Thr Thr Tyr Val Leu
 13 135 140

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Mon Tue Wed Thu Fri Sat Sun
Sun Mon Tue Wed Thu Fri Sat Sun

Glu Lys Gly Ser Phe Lys Thr Leu Thr Leu Pro Ser Leu Phe Leu Asn
 85 90 95
 Ser Ala Asp Glu Ile Tyr Glu Leu Arg Val Thr Gly Arg Thr Glu Asn
 100 105 110
 Glu Ile Leu Phe Ser Asn Ser Thr Arg Leu Ser Phe Glu Thr Lys Asn
 115 120 125
 Ile Ser Val Phe Ile Glu Thr Asp Lys Ala Leu Tyr Lys Phe Lys Glu
 130 135 140
 Glu Val Lys Phe Arg Ile Val Thr Leu Phe Ser Asp Phe Lys Phe Tyr
 145 150 155
 Lys Thr Ser Leu Asn Ile Leu Ile Lys Asp Pro Lys Ser Asn Leu Ile
 160 165 170
 Glu Glu Trp Leu Ser Glu Glu Ser Asp Leu Gly Val Ile Ser Lys Thr
 175 180 185
 Phe Glu Leu Ser Ser His Pro Ile Leu Gly Asp Trp Ser Ile Glu Val
 190 195 200
 Glu Val Asn Asp Glu Thr Tyr Tyr Glu Ser Phe Glu Val Ser Glu Tyr
 205 210 215
 Val Leu Phe Lys Phe Glu Val Thr Leu Glu Thr Pro Leu Lys Lys Ser
 220 225 230
 Met Asn Ser Lys His Leu Asn Gly Thr Ile Thr Ala Lys Tyr Thr Tyr
 235 240 245
 Gly Lys Phe Val Lys Gly Asp Val Thr Leu Thr Phe Leu Phe Leu Ser
 250 255 260
 Phe Trp Gly Lys Lys Lys Asn Ile Thr Lys Thr Phe Lys Ile Asn Gly
 265 270 275
 Ser Ala Asn Phe Ser Phe Asn Asp Glu Glu Met Lys Asn Val Met Asn
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 Ser Ser Asn Gly Leu Ser Glu Tyr Leu Asp Leu Ser Phe Phe Gly Trp
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 Val Glu Ile Leu Thr Thr Val Thr Glu Ser Val Thr Gly Ile Ser Arg
 310 315 320
 Asn Val Ser Thr Asn Val Phe Phe Lys Glu His Asp Tyr Ile Ile Glu
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 Isole Phe Asp Tyr Thr Thr Val Leu Lys Phe Ser Leu Asn Ile Thr Ala
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 Thr Val Lys Val Thr Arg Ala Asp Gly Asn Glu Leu Thr Thr Glu Glu
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 Arg Arg Asn Asn Val Val Ile Thr Val Thr Glu Arg Asn Tyr Thr Glu
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 Tyr Trp Ser Gly Ser Asn Ser Gly Asn Glu Lys Met Glu Ala Val Glu
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 Lys Ile Asn Tyr Thr Val Ile Glu Ser Gly Thr Phe Lys Ile Glu Phe
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 Phe Ile Leu Glu Asp Ser Ser Glu Leu His Leu Lys Ala Tyr Ser Leu
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 Gly Ser Lys Ser Ser Met Ala Val His Ser Leu Ile Lys Ser Phe Ser
 430 435 440
 Lys Thr Tyr Ile Glu Leu Lys Thr Arg Asp Glu Asn Ile Lys Val Gly
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 Ser Pro Phe Glu Leu Val Val Ser Gly Asn Lys Arg Leu Lys Glu Leu
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 Ser Tyr Met Val Val Ser Arg Gly Glu Leu Val Ala Val Gly Lys Glu
 475 480 485
 Asn Ser Thr Met Phe Ser Leu Thr Pro Glu Asn Ser Trp Thr Phe Lys
 490 495 500
 Ala Cys Val Ile Val Tyr Tyr Ile Glu Asp Asp Gly Glu Ile Ile Ser
 505 510 515
 Asp Val Leu Lys Ile Pro Val Glu Leu Val Phe Lys Asn Lys Ile Lys
 520 525 530
 Leu Tyr Thr Ser Lys Val Lys Ala Glu Phe Ser Glu Lys Val Ser Leu

565										570										575																											
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585										590										595																											
Asp	Lys	Ser	Val	Asn	Leu	Met	Asn	Ala	Ser	Asn	Asp	Ile	Thr	Met	Gln	Asp	Lys	Ser	Val	Asn	Leu	Met	Asn	Ala	Ser	Asn	Asp	Ile	Thr	Met	Gln	Asp	Lys	Ser	Val	Asn	Leu	Met	Asn	Ala	Ser	Asn	Asp	Ile	Thr	Met	Gln
600										605										610																											
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615										620										625																											
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645										650										655																											
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660										665										670																											
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Leu	Thr	Asp	Asn	Leu	Lys	Gln	Lys	Ala	Leu	Ser	Ile	Met	Arg	Gln	Gly	Leu	Thr	Asp	Asn	Leu	Lys	Gln	Lys	Ala	Leu	Ser	Ile	Met	Arg	Gln	Gly	Leu	Thr	Asp	Asn	Leu	Lys	Gln	Lys	Ala	Leu	Ser	Ile	Met	Arg	Gln	Gly
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Tyr	Gln	Arg	Gln	Leu	Tyr	Gln	Arg	Gln	Asp	Gly	Ser	Ile	Ser	Ile	Ala	Tyr	Gln	Arg	Gln	Leu	Tyr	Gln	Arg	Gln	Asp	Gly	Ser	Ile	Ser	Ile	Ala	Tyr	Gln	Arg	Gln	Leu	Tyr	Gln	Arg	Gln	Asp	Gly	Ser	Ile	Ser	Ile	Ala
945										950										955																											
Phe	Gly	Asn	Tyr	Asp	Pro	Ser	Gly	Ser	Thr	Trp	Leu	Ser	Ala	Phe	Val	Phe	Gly	Asn	Tyr	Asp	Pro	Ser	Gly	Ser	Thr	Trp	Leu	Ser	Ala	Phe	Val	Phe	Gly	Asn	Tyr	Asp	Pro	Ser	Gly	Ser	Thr	Trp	Leu	Ser	Ala	Phe	Val
960										965										970																											
Leu	Arg	Cys	Ile	Leu	Gln	Ala	Asp	Pro	Tyr	Ile	Asp	Ile	Asp	Gln	Asn	Leu	Arg	Cys	Ile	Leu	Gln	Ala	Asp	Pro	Tyr	Ile	Asp	Ile	Asp	Gln	Asn	Leu	Arg	Cys	Ile	Leu	Gln	Ala	Asp	Pro	Tyr	Ile	Asp	Ile	Asp	Gln	Asn
975										980										985																											
Val	Leu	His	Arg	Thr	Tyr	Thr	Trp	Leu	Lys	Gly	His	Gln	Lys	Ser	Asn	Val	Leu	His	Arg	Thr	Tyr	Thr	Trp	Leu	Lys	Gly	His	Gln	Lys	Ser	Asn	Val	Leu	His	Arg	Thr	Tyr	Thr	Trp	Leu	Lys	Gly	His	Gln	Lys	Ser	Asn
990										995										1000																											
Gly	Gln	Ile	Thr	Asp	Ile	Gly	Arg	Val	Ile	His	Ser	Gln	Leu	Gln	Gly	Gly	Gln	Ile	Thr	Asp	Ile	Gly	Arg	Val	Ile	His	Ser	Gln	Leu	Gln	Gly	Gly	Gln	Ile	Thr	Asp	Ile	Gly	Arg	Val	Ile	His	Ser	Gln	Leu	Gln	Gly
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Gly	Asn	Lys	Ser	Trp	Val	Thr	Leu	Thr	Ala	Tyr	Ile	Val	Thr	Ser	Leu	Gly	Asn	Lys	Ser	Trp	Val	Thr	Leu	Thr	Ala	Tyr	Ile	Val	Thr	Ser	Leu	Gly	Asn	Lys	Ser	Trp	Val	Thr	Leu	Thr	Ala	Tyr	Ile	Val	Thr	Ser	Leu
1020										1025										1030																											

Leu Gly Tyr Arg Lys Tyr Gln Pro Asn Ile Asp Val His Glu Ser Ile
 1060 1065 1070
 His Phe Leu Gln Ser Gln Phe Ser Arg Gly Ile Ser Asp Asn Tyr His
 1075 1080 1085
 Leu Ala Leu Ile Thr Tyr Ala Leu Ser Ser Val Gly Ser Pro Lys Ala
 1090 1095 1100
 Lys Glu Ala Leu Asn Met Leu Thr Trp Arg Ala Glu Gln His Gly Gly
 1105 1110 1115 1120
 Met Gln Phe Trp Val Ser Ser Glu Ser Lys Leu Ser Asp Ser Trp His
 1125 1130 1135
 Pro Arg Ser Leu Asp Ile Gln Val Ala Ala Tyr Ala Leu Leu Ser His
 1140 1145 1150
 Phe Leu Gln Phe Gln Thr Ser Glu Gly Ile Pro Ile Met Arg Trp Leu
 1155 1160 1165
 Ser Arg Gln Arg Asn Ser Leu Gly Gly Phe Ala Ser Thr Gln Asp Thr
 1170 1175 1180
 Thr Val Ala Leu Lys Ala Leu Ser Gln Phe Ala Ala Leu Met Asn Thr
 1185 1190 1195
 Gln Arg Thr Asn Ile Gln Val Thr Val Thr Gly Pro Ser Ser Pro Ser
 1200 1205 1210
 Pro Val Lys His Leu Ile Asp Thr His Asn Arg Leu Leu Leu Gln Thr
 1215 1220 1225
 Ala Gln Leu Ala Val Val Gln Pro Thr Ala Val Asn Ile Ser Ala Asn
 1230 1235 1240
 Gly Phe Gly Phe Ala Ile Cys Gln Leu Asn Val Val Tyr Asn Val Lys
 1245 1250 1255
 Ala Ser Gly Ser Ser Arg Arg Arg Arg Ser His Gln Asn His Ala Ala
 1260 1265 1270
 Phe Asp Leu Asp Val Ala Val Lys His Asn Lys Asp Asp Leu Asn His
 1275 1280 1285
 Val Asp Leu Asn Val Lys Thr Ser His Ser Gly Ser Gly Arg Ser Gly
 1290 1295 1300
 Met Ala Leu Met Gln Val Asn Leu Leu Ser Gly Phe Met Val Pro Ser
 1305 1310 1315
 His Ala Ile Ser Leu Ser Gln Thr Val Lys Lys Val His Lys Asp His
 1320 1325 1330
 Gly Lys Leu Asn Leu Tyr Leu Asp Ser Val Asn Gln Thr Asn Phe Lys
 1335 1340 1345
 Val Asn Ile Ser Ala Val Arg Asn Phe Lys Val Ser Asn His His Arg
 1350 1355 1360
 Ala Ser Val Asn Ile Val Asp Ser Lys His Pro Arg Arg His Ala Val
 1365 1370 1375
 Arg Ser Tyr Asn Ser His Val Lys Leu Ser Ser Cys Asp Leu Lys Leu
 1380 1385 1390
 Asp Val His Gly Lys Arg Pro Cys His Asp Gly Ala Ser Gly Ser His
 1395 1400 1405
 His His Ser Ser Val Ile Phe His Phe Cys His Lys Leu Leu Tyr His
 1410 1415 1420
 Met Gln Leu Trp Leu
 1425

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 <12> PRT
 <13> Heme captions

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Arg Ala Ser Pro Ala Gly Gly Pro Leu Gln Asp Val Val Ile Gln Arg
 39 40 45
 Tyr His Ile Pro Arg Ala Cys Pro Arg His Val Gln Met Gly Asp His
 50 55 60
 Val Arg Tyr His Tyr Asn Gly Thr Phe Gln Asp Gly Lys Lys Phe Arg
 65 70 75
 Ser Ser Tyr Asp Arg Asn Thr Leu Val Ala Ile Val Val Gly Val Gly
 80 85 90
 Arg Leu Ile Thr Gly Met Asp Arg Gly Leu Met Gly Met Cys Val Asn
 95 100 105
 Gln Arg Arg Arg Leu Ile Val Pro Pro His Leu Gly Tyr Gly Ser Ile
 110 115 120 125
 Gly Leu Ala Gly Leu Ile Pro Pro Asp Ala Thr Leu Tyr Phe Asp Val
 130 135 140
 Val Leu Leu Asp Val Trp Asn Lys Gln Asp Thr Val Val Val Ser Thr
 145 150 155 160
 Leu Leu Arg Pro Pro His Cys Pro Arg Met Val Gln Asp Gly Asp His
 165 170 175
 Val Arg Tyr His Tyr Asn Gly Thr Leu Leu Asp Gly Thr Ser Phe Arg
 180 185 190
 Thr Ser Tyr Ser Lys Gly Gly Thr Tyr Asp Thr Tyr Val Gly Ser Gly
 195 200 205
 Thr Leu Ile Lys Gly Met Asp Gln Gly Leu Leu Gly Met Cys Pro Gly
 210 215 220
 His Arg Arg Lys Ile Ile Ile Pro Phe Phe Leu Ala Tyr Gly Gln Lys
 225 230 235
 Gly Tyr Gly Thr Val Ile Pro Pro Gln Ala Ser Leu Val His His Val
 240 245 250
 Leu Leu Ile Asp Val His Asn Pro Lys Asp Ala Val His Leu Gln Thr
 255 260 265
 Leu Gln Leu Pro Pro Gly Cys Val Arg Arg Ala Gly Ala Gly Asp His
 270 275 280
 Met Arg Tyr His Tyr Asn Gly Ser Leu Met Asp Gly Thr Leu Phe Asp
 285 290 295
 Ser Ser Tyr Ser Arg Asn His Thr Tyr Asn Thr Tyr Ile Arg Gln Gly
 300 305 310
 Tyr Ile Ile Pro Gly Met Asp Gln Gly Leu Gln Gly Ala Cys Met Gly
 315 320 325
 Gln Arg Arg Arg Ile Thr Ile Pro Pro His Leu Ala Tyr Gly Gln Asn
 330 335 340
 Gly Thr Gly Arg Lys Ile Pro Gly Ser Ala Val Leu Ile Ile Asn Val
 345 350 355
 His Val Ile Asp Phe His Asn Pro Ala Asp Val Val His Ile Arg Thr
 360 365 370
 Leu Ser Arg Pro Ser His Thr Cys Asn Gln Thr Thr Lys Leu Gly Asp
 375 380 385
 His Val Arg Tyr His Tyr Asn Cys Ser Leu Leu Asn Gly Thr His Leu
 390 395 400
 Phe Thr Ser His Asp Tyr Gly Ala His His Ala Ala Thr Thr Gly Ala
 405 410 415
 Asn Lys Val Ile Gln Gly Leu Asp Thr Gly Leu Gln Gly Met Cys Val
 420 425 430
 Gly Gln Arg Arg Gln Leu Ile Val Pro Pro His Leu Ala His Gly Gln
 435 440 445
 Ser Gly Ala Arg Gly Val Pro Gly Ser Ala Val Leu Leu Phe Gln Val
 450 455 460
 Gln Leu Val Ser Arg Gln Asp Gly Leu Pro Thr Gly Tyr Leu Ile Val
 465 470 475
 Thr His Lys Arg Pro His Ala Asn Leu Ile His Arg Met Arg Leu Asn
 480 485 490
 Lys Asp Gly Gln Val Pro Pro His Gln Thr Thr Thr Thr Ile Lys Ala
 495 500 505

374 Thr Ala Leu Thr Phe Ala Lys Ser Tyr Ala Arg His His
 375
 Ser Leu Glu Glu Arg Lys Glu Ala Leu Tyr Glu Tyr Ala Arg Arg Arg
 376
 Phe Thr Glu Arg Arg Ala Glu Glu Ala Asp
 405 410

<210> 34
 <211> 44
 <212> 187
 <213> Homo sapiens

<410> 34
 Met Glu Glu Gly Gly Gly Gly Val Arg Ser Leu Val Pro Gly Gly His
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 Val Leu Leu Val Leu Cys Gly Leu Leu Glu Ala Ser Gly Gly Gly Arg
 20 25 30 35
 Ala Leu Pro Glu Leu Ser Asp Asp Ile Phe Phe Arg Val Asn Trp Trp
 40 45 50 55
 Gly Thr His Phe Ser Leu Pro Thr Thr Gly Val Leu Tyr Lys His Arg
 60 65 70 75
 Asn Tyr Val Ile Met Thr Thr Ala His Lys Leu Lys Tyr Lys Lys Lys
 80 85 90 95
 Leu Pro Leu Val Thr Ser Gly Asp Glu Glu His Ser Lys Asp Lys Lys
 100 105 110 115
 Gly Pro Asn Pro Arg Glu Leu Leu His Pro Leu Pro Lys Asn Ser Ser
 120 125 130 135
 Cys Ser Tyr Arg Ile Glu Ser Tyr Trp Thr Tyr His Val Tyr His Gly
 140 145 150 155
 Lys His Ile Arg His Tyr His Glu Glu Lys Leu Thr Gly His Lys Ile
 160 165 170 175
 Asn Ile His Glu Tyr Tyr Leu Gly Asn Met Leu Ala Lys Asn Leu Leu
 180 185 190 195
 Phe Glu Lys Glu Arg Glu Ala Glu Glu Lys Glu Lys Ser Asn His Leu
 200 205 210 215
 Pro Thr Lys Asn Ile Glu Gly Glu Met Thr Pro Tyr Tyr Ile Val Gly
 220 225 230 235
 Met Gly Asn Gly Thr Ser Cys Ser Leu Lys Asn Asn Arg Pro Arg Ser
 240 245 250 255
 Ser Thr Val Met Tyr Ile Tyr His Ser Asn Ser Lys His Thr Ile Leu
 260 265 270 275
 Ser Val Ala Ser Val Thr Thr Cys Glu Tyr Glu Val Val Ile Leu Thr
 280 285 290 295
 Pro Leu Leu Cys Ser His Pro Lys Tyr Arg Phe Arg Ala Ser Pro Val
 300 305 310 315
 Asn Asp Ile Phe Tyr Glu Ser Leu Pro Gly Ser Pro Phe Lys Pro Leu
 320 325 330 335
 Thr Leu Arg Glu Leu Glu His Glu Glu Glu Glu Ile Leu Arg Val Pro Phe
 340 345 350 355
 Arg Arg Asn Lys Glu Glu Asp Leu His Ser Thr Lys Glu Thr Arg Phe
 360 365 370 375
 Pro Ala Ile His Lys Ser Ile Ala Ile Gly Ser Glu Pro Val Leu Thr
 380 385 390 395
 Val Gly Thr Thr His Ile Ser Lys Leu Thr Asp Asp His Leu Ile Lys
 400 405 410 415
 Glu Phe Leu Ser Gly Ser Tyr Cys Phe Arg Gly Gly Val Gly Trp Trp
 420 425 430 435
 Lys Tyr Glu Phe Cys Tyr Gly Lys Glu Val His Asn Tyr His His Asn
 440 445 450 455
 Lys Asp Ser Gly Lys Thr Ser Val Val Val Gly Thr Trp Asn His Glu

130 135 140
 Ala Pro Val Thr Tyr Thr Lys His Ile Gln Trp Ile Cys Leu Gln Ala
 145 150 155
 Ser Thr Phe Glu Phe Glu Asn Arg Thr Asp Cys Trp Val Thr Gly Trp
 160 165 170
 Gly Tyr Ile Lys Glu Asp Glu Ala Leu Phe Ser Pro His Thr Leu Gln
 175 180 185 190
 Glu Val Gln Val Ala Ile Ile Asn Asn Ser Met Cys Asn His Leu Ile
 195 200 205
 Leu Lys Tyr Ser Phe Arg Lys Asp Ile Phe Gly Asp Met Val Cys Ala
 210 215 220
 Gly Asn Ala Gln Gly Gly Lys Asp Ala Cys Phe Gly Asp Ser Gly Gly
 225 230 235
 Pro Leu Ala Cys Asn Lys Asn Gly Leu Trp Tyr Gln Ile Gly Val Val
 240 245 250
 Ser Trp Gly Val Gly Cys Gly Arg Pro Asn Arg Pro Gly Val Tyr Thr
 255 260 265
 Asn Ile Ser His His Phe Gln Trp Ile Gln Lys Leu Met Ala Gln Ser
 270 275 280 285
 Gly Met Ser Gln Pro Asp Pro Ser Trp Phe Leu Leu Phe Gln Pro Leu
 290 295 300
 Leu Trp Ala Leu Pro Leu Leu Gly Pro Val
 305 310

<211> 31
 <211> 34
 <211> 37
 <211> Hand sample

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 Met Val Val Ala Gly Val Val Val Leu Ile Leu Ala Leu Val Leu Ala
 20 25 30
 Trp Leu Ser Thr Tyr Val Ala Asp Ser Gly Ser Asn Gln Leu Leu Gly
 35 40 45
 Ala Ile Val Ser Ala Gly Asp Thr Ser Val Leu His Leu Gly His Val
 50 55 60
 Asp His Leu Val Ala Gly Gln Gly Asn Pro Gln Pro Thr Val Leu Pro
 65 70 75
 His Pro Ser Ala Ala Asn Thr Ser Leu Asp Lys Lys Ala Met
 80 85

<211> 34
 <211> 37
 <211> 39
 <211> Hand sample

34 37
 Met Ala Ser Lys Ile Gly Ser Arg Arg Trp Met Leu Gln Leu Ile Met
 1 5 10 15
 Gln Leu Gly Ser Val Leu Leu Thr Arg Cys Pro Phe Trp Gly Cys Phe
 20 25 30
 Ser Gln Leu Met Leu Tyr Ala Gln Arg Ala Gln Ala Arg Arg Lys Pro
 35 40 45
 Asp Ile Pro Val Pro Tyr Leu Tyr Phe Asp Met Gly Ala Ala Val Leu
 50 55 60
 Cys Ala Ser Phe Met Ser Phe Gly Val Lys Arg Arg Trp Phe Ala Leu
 65 70 75
 Gly Ala Ala Leu Phe Leu Ala Ile Ser Thr Tyr Ala Ala Tyr Ile Gly
 80 85

Gly Tyr Val His Tyr Gly Asp Trp Leu Lys Val Arg Met Tyr Ser Arg
 137 141 145
 Thr Val Ala Ile Ile Gly Gly Leu Ser Cys Val Gly Gln Arg Cys Ile
 146 150
 Gly Ala Val Pro Pro Glu Thr Ser Gln Pro Leu Pro Ala Val His Arg
 151 155
 Pro Gly Val Ser Gly Tyr Leu Pro His Leu Cys Gly Leu Leu Thr Ala
 156 160
 Ala Gln Ala Gly Gly Pro Ala Gly Val Ser Glu Pro Ser Pro Arg Arg
 161 165
 Gly Ala Asp Asp Pro Ala Val Leu Arg Ala Val Trp His Pro Gly Pro
 166 170
 Gly Leu Ser Val Arg Leu Leu Arg Asp Pro Arg Cys Pro Asp Pro Gly
 171 175
 Cys Thr Ala Ala Pro Cys His Ala Ala His
 180 185

210 215
 220 225
 230 235
 240 245

Met Thr Thr Ile Lys Leu Leu Leu Ile Lys Val Pro Leu Val Ile Ser
 250 255
 Ser Arg Ile Asp Gln Asp Asn Ser Ser His Asp Ser Leu Ser Pro Ser
 260 265
 Pro Lys Ser Arg His Ala Met Leu Asp Asp Val Lys Ile Leu Ala Asn
 270 275
 Gly Leu Leu Ile Leu Gly His Gly Leu Lys Asp Ile Val His Lys Thr
 280 285
 Lys Gly Gln Ile Asn Asp Ile Phe Gln Lys Leu Asn Ile Phe Asp Gln
 290 295
 Ser Phe Tyr Asp Leu Ser Leu Gln Thr Ser Gln Ile Lys His Gln Gln
 300 305
 Lys His Leu Arg Arg Thr Thr Tyr Lys Leu Gln Val Lys Asn His Phe
 310 315
 Val Lys Asn Ser Ser Leu His Leu Asn Ser Lys Leu His Thr Ile Leu
 320 325
 His Val Lys Ile Leu Leu Gln Asn Lys Val Lys Tyr Leu His His Gln
 330 335
 Leu Thr Asn Leu Ile Gln Asn His Ser His Thr His His His His Gln
 340 345
 Val Thr Ser Leu Lys Thr Phe Val His Lys Gln Asp Asn Ser Ile Lys
 350 355
 Asp Leu Leu His Thr Val His Asp His Tyr Lys His Leu Asn His Gln
 360 365
 His Ser His Ile Lys Gln Ile His Asn His Leu Arg Arg Thr Thr Ile
 370 375
 Gln Gln Pro Thr Gln Ile Ser Leu Ser Ser Lys Pro Arg Ala His Arg
 380 385
 Thr Thr Pro Phe Leu Gln Leu Asn Gln Ile Arg Asn Val Lys His Asp
 390 395
 Gly Ile Pro Ala His Cys Thr Thr Ile Tyr Asn Arg His His His Thr
 400 405
 Ser Gly Met Tyr Ala Ile Arg Pro Ser Asn Ser His Val Ile His Val
 410 415
 Tyr Tyr Asp Val Ile Ser Gly Ser Pro Thr Thr Leu Ile His His Arg
 420 425
 Ile Asp Gly His His Asn His Asn His Thr Ile His Asn Lys Lys Tyr
 430 435

Gly Phe Gly Arg Leu Asp Gly Glu Phe Trp Leu Gly Leu His Lys Ile
335 310 315
Tyr Ser Ile Val Lys Val Ser Asn Tyr Val Leu Arg Ile His Leu His
335 335 335
Asp Trp Lys Asp Asn Lys His Tyr Ile Glu Tyr Ser Phe Tyr Leu Gly
340 345 345
Asn His Glu Thr Asn Tyr Thr Leu His Leu Val Ala Ile Thr Gly Asn
345 350 355
Val Pro Asn Ala Ile Pro Glu Asn Lys Asp Leu Val Phe Ser Thr Trp
360 365 365
Asp His Lys Ala Lys Gly His Phe Asn Cys Pro Glu Gly Tyr Ser Gly
385 390 395 400
Gly Trp Trp Trp His Asp Glu Cys Gly Glu Asn Asn Leu Asn Gly Lys
405 410 415
Tyr Asn Lys Pro Arg Ala Lys Ser Lys Pro His Arg Asn Arg Gly Ile
420 425 430
Ser Trp Lys Ser Val Asn Gly Arg Leu Tyr Ser Ile Lys Ser Thr Lys
435 440 445
Met Leu Ile His Pro Thr Asp Ser His Ser Phe His
450 455 460

*210-1
*211-1
*212- PKT
*213- H m. sapiens

*470-4
Met Val Leu Met His Leu Leu Gly Arg Leu His Lys Ile Leu Leu Leu
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Leu Cys His Ala Ser Phe Leu Leu Gly Leu Ala Leu Leu His Ile Lys
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Thr Asp Ile Thr Arg Val Ala Tyr Phe Phe Leu Thr Leu Gly Gly Ile
30 35 40
Phe Leu Ile Ala Tyr Leu Leu Val Arg Phe Leu Glu Trp His Leu Arg
45 50 55
Ser His Leu His Ser Met His Thr His Ser Ile His Ile Ser Gly Asn
60 65 70
Ala Arg Asp Asn His Ala Phe His Val Ser Val Tyr His His Ala Val
75 80 85
Val Gly Leu His Ser His Cys Arg Pro His His Leu Arg His Pro His
90 95 100
Pro Tyr Ser Thr Val Val Ile Arg Arg His Pro Ala His His His Ile
105 110 115
Ser His His His Gly Ser Arg Arg Ala Lys Leu His His Arg Arg Met
120 125 130
Ala Ser His Gly Ser Met Ala His His Gly Ser Pro His Arg Ala Ile
135 140 145
His Asp Leu Arg Leu Arg Gly Pro Arg Ala Val Ser Ile Ala Pro Arg
150 155 160
Leu His Ser Leu Ala Ala Val Pro Thr Leu His Arg Leu Thr Pro His
165 170 175
Pro Ala Tyr Asp Val Cys Phe Gly His Pro Asp Asp Asp Ser Val His
180 185 190 195
Tyr Glu Asp Asn Tyr Ala Pro Pro
200 205 210

*210-41
*211-4-4
*212-1NA
*213- H m. sapiens

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<210> 34
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 <212> DNA
 <213> Homo sapiens

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<211> 41
 <211> 1-21
 <212> DNA
 <213> Homo sapiens

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411-46
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411-10A
411-Home sapiens

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411-47
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411-Home sapiens

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169	Met	Met	Met	Met	Met	Glu	Glu	Gly	Val	Phe	Glu	Lys	Gly	Pro				174
Asn	His	Leu																

155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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Ile	Pro	Val	Gln	Leu	Val	Phe	Lys	Asn	Lys	Ile	Lys	Leu	Tyr	Trp	Ser		
587						585				587							
aaa	atg	aaa	gat	glu	aca	tat	gaa	aaa	gac	tat	att	agg	gac	tat	atg		1874
Lys	Val	Lys	Ala	Glu	Pro	Ser	Gln	Lys	Val	Ser	Leu	Arg	Ile	Ser	Val		
588						570				588							
aaa	cag	cct	gac	tcc	ata	gtt	ggt	att	tta	ggt	gac	aaa	gac	gac	gac		1875
Thr	Gln	Pro	Asp	Ser	Ile	Val	Gly	Ile	Val	Ala	Val	Asp	Lys	Ser	Val		
						595				590							
aat	ctt	atg	aat	gac	tat	aat	gat	att	aca	atg	gaa	aat	atg	atg	atg		1876
Asn	Leu	Met	Asn	Ala	Ser	Asn	Asp	Ile	Thr	Met	Glu	Asn	Val	Val	His		
						600				605							
gag	ttg	gaa	ctt	tat	aac	aca	gga	tat	tat	tta	ggc	atg	ttc	atg	aat		1877
Glu	Leu	Glu	Leu	Tyr	Asn	Thr	Gly	Tyr	Tyr	Leu	Gly	Met	Phe	Met	Asn		
						615				620							
tct	ttt	aca	ggt	ttt	cag	gaa	tgt	gga	cac	atg	gta	ttg	ata	gat	ata		1878
Ser	Phe	Ala	Val	Phe	Gln	Glu	Cys	Gly	Leu	Trp	Val	Leu	Thr	Asp	Ala		
						630				640							
aaa	ctc	aaa	atg	gat	tat	att	gat	ggt	tta	tat	gat	att	tta	gat	tat		1879
Asn	Leu	Thr	Lys	Asp	Tyr	Ile	Asp	Gly	Val	Tyr	Asp	Asn	Ala	Glu	Tyr		
						645				650							
gat	gag	atg	ttt	ata	gac	aaa	aat	gaa	gga	cat	att	ata	ttt	att	aat		1880
Ala	Gln	Arg	Phe	Met	Gln	Gln	Asn	Gln	Gly	His	Ile	Val	Asp	Ile	His		
						655				660							
gac	ttt	ttt	ttt	ggt	agg	agt	aca	tat	ttc	gga	aat	ttt	ttt	cca	gat		1881
Asp	Phe	Ser	Leu	Gly	Ser	Ser	Phe	His	Val	Arg	Lys	His	Phe	Phe	Gln		
						665				670							
aat	ttt	ttt	ttt	ctt	ttc	ttt	aat	att	ttt	ttt	agg	ttt	ttt	cca	ttt		1882
Thr	Trp	Ile	Trp	Leu	Asp	Thr	Asn	Met	Gly	Ser	Arg	Ile	Tyr	Gln	Gln		
						675				680							
ttt	gaa	ttt	att	gta	cct	gat	ttt	att	att	ttt	ttt	ttt	ttt	att	ttt		1883
Phe	Glu	Val	Thr	Val	Pro	Asp	Ser	Ile	Thr	Ser	Trp	Val	Ala	Thr	Gly		
						710				720							
ttt	atg	aaa	tct	gag	gac	ctt	ggt	ttt	gga	ctt	aca	aat	aat	cca	atg		1884
Phe	Val	Ile	Ser	Glu	Asp	Leu	Gly	Leu	Gly	Leu	Thr	Thr	Thr	Pro	Val		
						730				740							
gac	ctc	ttt	ggt	ttt	aaa	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt		1885
Gln	Leu	Gln	Ala	Phe	Gln	Phe	Phe	Phe	Ile	Phe	Leu	Asn	Leu	Phe	Tyr		
						750				760							
ttt	ttt	ttt	ttt	ggt	gaa	gaa	tat	ggt	ttt	ttt	gaa	ata	ttt	ttt	ttt		1886
Ser	Val	Ile	Arg	Gly	Gln	Gln	Phe	Ala	Leu	Gln	Ile	Thr	Ile	Phe	Asn		
						765				770							
tat	ttg	aaa	ttt	gaa	act	gag	ggt	gag	ttt	att	att	ttt	ttt	ttt	ttt		1887
Tyr	Leu	Lys	Asp	Ala	Thr	Gln	Val	Lys	Val	Ile	Ile	Gln	Lys	Ser	Asp		
						775				780							
aaa	ttt	ttt	ttt	cta	atg	att	ttt	agt	ttt	ttt	aat	ttt	ttt	ggt	ttt		1888
Lys	Phe	Asp	Ile	Leu	Met	Thr	Ser	Ser	Leu	Ile	Asn	Ala	Thr	Gly	His		
						785				790							
ttt	gag	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	gga	att	ttt	ttt	ttt		1889
Gln	Gln	Thr	Leu	Leu	Val	Pro	Ser	Gln	Asp	Gly	Ala	Thr	Val	Leu	Phe		
						810				820							
aat	atc	agg	cta	aca	aat	ttg	gga	gaa	att	ttt	att	aca	ttt	aca	ttt		1890
Pro	Ile	Arg	Pro	Thr	His	Leu	Gly	Glu	Ile	Pro	Ile	Thr	Val	Thr	Ala		
						825				830							
att	tca	ttt	aat	ggt	tct	gat	ggt	atc	att	cag	atg	aat	ttt	gta	aat		1891
Leu	Ser	Pro	Thr	Ala	Ser	Asp	Ala	Ile	Thr	Gln	Met	Ile	Leu	Val	Lys		
						840				845							
ggt	gaa	gga	ata	gaa	aaa	tta	tca	taa	ttt	ata	tta	tta	gaa	ttt			1892
Ala	Gln	Gly	Ile	Gln	Lys	Ser	Tyr	Ser	Gln	Ser	Ile	Leu	Leu	Asp	Leu		
						850				855							
aat	gac	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt		1893
Thr	Asp	Asn	Arg	Leu	Gln	Ser	Thr	Leu	Lys	Thr	Leu	Ser	Ile	Ser	Phe		

Pro	Pro	Asn	Thr	Val	Thr	Gly	Ser	Gln	Asp	Val	Gln	Ile	Thr	Ala	Leu	2141
890				890				895								
Gly	Asp	Val	Leu	Gly	Pro	Ser	Ile	Asn	Gly	Leu	Ala	Ser	Leu	Ile	Asp	2142
905				905				910								
Met	Pro	Tyr	Gly	Cys	Gly	Gln	Gln	Asn	Met	Ile	Asn	Ile	Ala	Pro	Asp	2143
925				925				935								
Ile	Tyr	Ile	Leu	Asp	Tyr	Leu	Thr	Lys	Lys	Lys	Gln	Leu	Thr	Asp	Asn	2144
935				935				940								
Leu	Lys	Gln	Lys	Ala	Leu	Ser	Pro	Met	Arg	Gln	Gly	Tyr	Gln	Arg	Ser	2145
950				955				960								
Leu	Leu	Tyr	Gln	Arg	Gln	Asp	Gly	Ser	Ile	Ser	Ala	Ile	Gly	Asn	Lys	2146
970				975				985								
Asp	Pro	Leu	Gly	Ser	Thr	Tyr	Leu	Ser	Ala	Pro	Val	Leu	Asp	Lys	Ile	2147
990				995				1000								
Leu	Gln	Ala	Asp	Pro	Tyr	Ile	Asp	Ile	Asp	Gln	Asn	Val	Leu	His	Arg	2148
1010				1015				1020								
Thr	Tyr	Thr	Ile	Leu	Lys	Gly	His	Gln	Lys	Ser	Asn	Gly	Gln	Ile	Arg	2149
1030				1035				1040								
Asp	Pro	Gly	Arg	Val	Ile	His	Ser	Gln	Leu	Gln	Gly	Gly	Asn	Lys	Ser	2150
1050				1055				1060								
Pro	Val	Thr	Leu	Thr	Ala	Tyr	Ile	Val	Thr	Ser	Leu	Leu	Gly	Tyr	Arg	2151
1070				1075				1080								
Lys	Tyr	Gln	Pro	Asn	Ile	Asp	Val	Gln	Gln	Ser	Ile	His	Ile	Leu	Gln	2152
1090				1095				1100								
Leu	Gln	Ile	Ser	Arg	Gly	Ile	Ser	Asp	Asn	Tyr	Thr	Leu	Ala	Leu	Leu	2153
1110				1115				1120								
Thr	Tyr	Ala	Leu	Ser	Ser	Val	Gly	Ser	Ile	Lys	Ala	Lys	Gln	Ala	Leu	2154
1130				1135				1140								
Asn	Met	Leu	Thr	Tyr	Arg	Ala	Gln	Gln	Gln	Gly	Gly	Met	Gln	Ile	Arg	2155
1150				1155				1160								
Val	Ser	Ser	Gln	Ser	Lys	Leu	Ser	Asp	Asn	Tyr	Gln	Ile	Asp	Ser	Leu	2156
1170				1175				1180								
Asp	Ile	Gln	Val	Ala	Ala	Tyr	Ala	Leu	Leu	Ser	His	Ile	Leu	Gln	Asn	2157
1190				1195				1200								
Gag	act	tot	gag	dga	atc	dca	att	atg	add	igg	cta	gac	ang	dca	aga	2158
1210				1215				1220								
Asn	Ser	Leu	Gly	Gly	Pro	Ala	Ser	Thr	Gln	Asp	Thr	Thr	Val	Ala	Leu	2159
1230				1235				1240								
Lys	Ala	Leu	Ser	Gln	Pro	Ala	Ala	Leu	Met	Asn	Thr	Gln	Arg	Thr	Asn	2160
1250				1255				1260								

2.1.1	2.1.2	2.1.3	2.1.4	2.1.5	2.1.6	2.1.7	2.1.8	2.1.9	2.1.10	2.1.11	2.1.12	2.1.13	2.1.14	2.1.15	2.1.16	2.1.17	2.1.18	2.1.19	2.1.20	2.1.21	2.1.22	2.1.23	2.1.24	2.1.25	2.1.26	2.1.27	2.1.28	2.1.29	2.1.30	2.1.31	2.1.32	2.1.33	2.1.34	2.1.35	2.1.36	2.1.37	2.1.38	2.1.39	2.1.40	2.1.41	2.1.42	2.1.43	2.1.44	2.1.45	2.1.46	2.1.47	2.1.48	2.1.49	2.1.50	2.1.51	2.1.52	2.1.53	2.1.54	2.1.55	2.1.56	2.1.57	2.1.58	2.1.59	2.1.60	2.1.61	2.1.62	2.1.63	2.1.64	2.1.65	2.1.66	2.1.67	2.1.68	2.1.69	2.1.70	2.1.71	2.1.72	2.1.73	2.1.74	2.1.75	2.1.76	2.1.77	2.1.78	2.1.79	2.1.80	2.1.81	2.1.82	2.1.83	2.1.84	2.1.85	2.1.86	2.1.87	2.1.88	2.1.89	2.1.90	2.1.91	2.1.92	2.1.93	2.1.94	2.1.95	2.1.96	2.1.97	2.1.98	2.1.99	2.1.100
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1. *Chlorophyll a* (Chl *a*)
 2. *Chlorophyll b* (Chl *b*)
 3. *Chlorophyll c* (Chl *c*)
 4. *Chlorophyll d* (Chl *d*)
 5. *Chlorophyll e* (Chl *e*)
 6. *Chlorophyll f* (Chl *f*)
 7. *Chlorophyll g* (Chl *g*)
 8. *Chlorophyll h* (Chl *h*)
 9. *Chlorophyll i* (Chl *i*)
 10. *Chlorophyll j* (Chl *j*)
 11. *Chlorophyll k* (Chl *k*)
 12. *Chlorophyll l* (Chl *l*)
 13. *Chlorophyll m* (Chl *m*)
 14. *Chlorophyll n* (Chl *n*)
 15. *Chlorophyll o* (Chl *o*)
 16. *Chlorophyll p* (Chl *p*)
 17. *Chlorophyll q* (Chl *q*)
 18. *Chlorophyll r* (Chl *r*)
 19. *Chlorophyll s* (Chl *s*)
 20. *Chlorophyll t* (Chl *t*)
 21. *Chlorophyll u* (Chl *u*)
 22. *Chlorophyll v* (Chl *v*)
 23. *Chlorophyll w* (Chl *w*)
 24. *Chlorophyll x* (Chl *x*)
 25. *Chlorophyll y* (Chl *y*)
 26. *Chlorophyll z* (Chl *z*)
 27. *Chlorophyll aa* (Chl *aa*)
 28. *Chlorophyll ab* (Chl *ab*)
 29. *Chlorophyll ac* (Chl *ac*)
 30. *Chlorophyll ad* (Chl *ad*)
 31. *Chlorophyll ae* (Chl *ae*)
 32. *Chlorophyll af* (Chl *af*)
 33. *Chlorophyll ag* (Chl *ag*)
 34. *Chlorophyll ah* (Chl *ah*)
 35. *Chlorophyll ai* (Chl *ai*)
 36. *Chlorophyll aj* (Chl *aj*)
 37. *Chlorophyll ak* (Chl *ak*)
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[illegible]

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 Glu Ile Glu Ile Glu Ile Glu Ile Glu Ile Glu Ile Glu Ile Glu Ile
 150

Tyr	Lys	Gln	Asp	Asn	Tyr	Val	Ile	Met	Thr	Thr	Ala	His	Lys	Glu	Lys		
				65													
tat	aaa	taa	ata	ctt	aac	ctt	gtg	aca	agt	ttg	gat	aaq	gaa	gaa	gaa	gaa	492
Tyr	Lys	Cys	Ile	Leu	Pro	Leu	Val	Thr	Ser	Gly	Asp	Glu	Glu	Glu	Glu	Glu	
				80				85					90				
aaq	gat	tat	aaa	ggc	act	aat	cca	aga	gag	ctt	tta	gag	aaa	aaa	aaa	aaa	540
Lys	Asp	Tyr	Lys	Gly	Pro	Asn	Pro	Arg	Glu	Leu	Leu	Glu	Pro	Leu	Ile	Ile	
				100				105				110					
aaa	aaa	aaa	agt	tgt	taa	taa	aga	att	gaa	tat	tat	taa	act	taa	taa	taa	588
Lys	Gln	Ser	Ser	Cys	Ser	Tyr	Arg	Ile	Glu	Ser	Tyr	Tyr	Thr	Thr	Tyr	Gln	
				115				120				125					
gta	tat	taa	gga	aaa	aac	att	agg	cag	taa	cat	gaa	gag	aaa	aaa	aaa	aaa	436
Val	Cys	His	Gly	Lys	His	Ile	Arg	Gln	Tyr	His	Glu	Glu	Lys	Glu	Glu	Thr	
				130				135				140					
agt	cag	aaa	ata	aat	att	aac	gag	taa	taa	ctt	ggg	aat	atg	tta	ttt	ttt	484
Gly	Gln	Lys	Ile	Asn	Ile	His	Glu	Tyr	Tyr	Leu	Gly	Asn	Met	Leu	Ala	Ala	
				145				150				155					
aaq	aaa	aaa	aaa	ttt	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	532
Lys	Asn	Leu	Leu	Phe	Gln	Lys	Gln	Arg	Gln	Ala	Gln	Gln	Lys	Gln	Lys	Lys	
				160				165				170					
taa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	580
Ser	Asn	Gln	Ile	Pro	Thr	Lys	Asn	Ile	Glu	Gly	Gln	Met	Tar	Ile	Tyr	Tyr	
				175				180				185					
tat	ctt	ata	gga	atg	gga	aat	ggt	aca	act	tgt	agt	tta	aaa	aaa	aaa	aaa	628
Tyr	Phe	Val	Gly	Met	Gly	Asn	Gly	Thr	Pro	Cys	Ser	Leu	Lys	Gln	Asn	Asn	
				190				195				200					
aaa	aaa	aaa	aaa	agt	act	gta	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	676
Arg	Phe	Asn	Ser	Ser	Thr	Val	Met	Tyr	Ile	Cys	His	Ile	Gln	Asn	Lys	Lys	
				205				210				215					
taa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	724
His	Gln	Ile	Leu	Ser	Val	Ala	Gln	Val	Thr	Thr	Cys	Gln	Tyr	Gln	Val	Val	
				225				230				235					
gta	agt	aaa	aca	caa	ctc	tgg	tgc	agt	cat	cat	aaa	aat	agg	ttt	aaa	aaa	772
Val	Ile	Leu	Thr	Pro	Leu	Leu	Cys	Ser	His	Pro	Lys	Tyr	Arg	Phe	Arg	Arg	
				240				245				250					
aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	820
Ala	Asn	Phe	Val	Asn	Asp	Ile	Phe	Cys	Gln	Ser	Leu	Ile	Gly	Asn	Ile	Ile	
				255				260				265					
taa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	868
Phe	Lys	Ile	Leu	Tar	Leu	Arg	Gln	Leu	Gln	Gln	Gln	Gln	Gln	Gln	Gln	Gln	
				270				275				280					
agg	aaa	aaa	aaa	agg	aga	aat	aaa	gag	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	916
Arg	Val	Pro	Phe	Arg	Arg	Asn	Lys	Glu	Glu	Asn	Leu	Gln	Ser	Thr	Lys	Lys	
				285				290				295					
aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	964
Gln	Ile	Asn	Ile	Phe	Ala	Ile	His	Lys	Ser	Leu	Ala	Ile	Gly	Asn	Gln	Gln	
				300				305				310					
aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	1012
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Gln	Leu	Ile	Lys	Glu	Phe	Leu	Ser	Gly	Ser	Tyr	Cys	Phe	Arg	Gly	Gly	Gly	
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Val	Gly	Tyr	Tyr	Lys	Tyr	Glu	Phe	Cys	Tyr	Gly	Lys	His	Val	His	Gln	Gln	
				345				350				355					
taa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	aaa	1156
Tyr	His	Gln	Asp	Lys	Asp	Ser	Gly	Lys	Thr	Asn	Val	Val	Val	Val	Gly	Leu	
				360				365				370					
ttt	aaa	aaa	aaa	gag	cat	aaa	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	ttt	1204
Tyr	Asn	Gln	Gln	Gln	His	Ile	Gln	Tyr	Ala	Lys	Lys	Asn	Thr	Ala	Asn	Asn	
				375				380				385					

435															1355																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
ggt tat cat ctt cta gac gat gtt acc taa aat itc att att itg taa															400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670	680	690	700	710	720	730	740	750	760	770	780	790	800	810	820	830	840	850	860	870	880	890	900	910	920	930	940	950	960	970	980	990	1000	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510	2520	2530	2540	2550	2560	2570	2580	2590	2600	2610	2620	2630	2640	2650	2660	2670	2680	2690	2700	2710	2720	2730	2740	2750	2760	2770	2780	2790	2800	2810	2820	2830	2840	2850	2860	2870	2880	2890	2900	2910	2920	2930	2940	2950	2960	2970	2980	2990	3000	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290	3300	3310	3320	3330	3340	3350	3360	3370	3380	3390	3400	3410	3420	3430	3440	3450	3460	3470	3480	3490	3500	3510	3520	3530	3540	3550	3560	3570	3580	3590	3600	3610	3620	3630	3640	3650	3660	3670	3680	3690	3700	3710	3720	3730	3740	3750	3760	3770	3780	3790	3800	3810	3820	3830	3840	3850	3860	3870	3880	3890	3900	3910	3920	3930	3940	3950	3960	3970	3980	3990	4000	4010	4020	4030	4040	4050	4060	4070	4080	4090	4100	4110	4120	4130	4140	4150	4160	4170	4180	4190	4200	4210	4220	4230	4240	4250	4260	4270	4280	4290	4300	4310	4320	4330	4340	4350	4360	4370	4380	4390	4400	4410	4420	4430	4440	4450	4460	4470	4480	4490	4500	4510	4520	4530	4540	4550	4560	4570	4580	4590	4600	4610	4620	4630	4640	4650	4660	4670	4680	4690	4700	4710	4720	4730	4740	4750	4760	4770	4780	4790	4800	4810	4820	4830	4840	4850	4860	4870	4880	4890	4900	4910	4920	4930	4940	4950	4960	4970	4980	4990	5000	5010	5020	5030	5040	5050	5060	5070	5080	5090	5100	5110	5120	5130	5140	5150	5160	5170	5180	5190	5200	5210	5220	5230	5240	5250	5260	5270	5280	5290	5300	5310	5320	5330	5340	5350	5360	5370	5380	5390	5400	5410	5420	5430	5440	5450	5460	5470	5480	5490	5500	5510	5520	5530	5540	5550	5560	5570	5580	5590	5600	5610	5620	5630	5640	5650	5660	5670	5680	5690	5700	5710	5720	5730	5740	5750	5760	5770	5780	5790	5800	5810	5820	5830	5840	5850	5860	5870	5880	5890	5900	5910	5920	5930	5940	5950	5960	5970	5980	5990	6000	6010	6020	6030	6040	6050	6060	6070	6080	6090	6100	6110	6120	6130	6140	6150	6160	6170	6180	6190	6200	6210	6220	6230	6240	6250	6260	6270	6280	6290	6300	6310	6320	6330	6340	6350	6360	6370	6380	6390	6400	6410	6420	6430	6440	6450	6460	6470	6480	6490	6500	6510	6520	6530	6540	6550	6560	6570	6580	6590	6600	6610	6620	6630	6640	6650	6660	6670	6680	6690	6700	6710	6720	6730	6740

His 140	Leu	Glu	Val	Glu	Cys	Arg	Trp	Arg	Gln	Ser	Pro	Trp	Glu	Ala	Ala	
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Gly	Arg	Gly	Leu	Pro	Trp	Glu	Glu	Ala	Glu	Ala	Ala	Gly	Leu	Gly	Arg	
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Asp	Lys	Val	Ser	Tyr	Ser	Pro	Ser	Trp	Arg	Glu	Ser	Leu	Gly	Gly	Leu	
				175					180							
tta	tct	ggc	atg	gag	tgg	gat	ctg	gtg	tgt	gag	cag	aaa	ggt	ctg	aac	628
Leu	Ser	Gly	Met	Glu	Trp	Asp	Leu	Val	Cys	Glu	Gln	Lys	Gly	Leu	Asn	
				190					195							
aga	gct	ggg	tcc	act	ttc	ttc	ttc	gac	ggt	gtg	ctg	gtg	ggg	gct	gtg	676
Arg	Ala	Ala	Ser	Thr	Phe	Phe	Phe	Ala	Gly	Val	Leu	Val	Gly	Ala	Val	
				205					210							
gac	ttt	gga	tat	ctg	tcc	gac	agg	ttt	ggg	ggg	ggg	agg	ctg	ctg	ctg	724
Ala	Phe	Gly	Tyr	Leu	Ser	Asp	Arg	Phe	Gly	Arg	Arg	Arg	Leu	Leu	Leu	
				220					225							
gta	gac	tac	gtg	agt	aac	gtg	gtg	ctg	ggc	ctg	gaa	tat	gaa	gac	gtt	772
Val	Ala	Tyr	Val	Ser	Thr	Leu	Val	Leu	Gly	Leu	Ala	Ser	Ala	Ala	Ser	
				240					245							
gtc	aga	tat	gta	atg	tat	gac	atc	acc	ggc	acc	att	aat	ggc	tca	gac	820
Val	Ser	Tyr	Val	Met	Phe	Ala	Ile	Thr	Arg	Thr	Leu	Thr	Gly	Ser	Ala	
				255					260							
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Leu	Ala	Gly	Phe	Thr	Ile	Ile	Val	Met	Pro	Leu	Glu	Leu	Glu	Trp	Leu	
				270					275							
tat	gtc	gag	cac	ggc	acc	gtc	gct	gga	gtc	ctg	agg	agg	aat	tta	tta	916
Asp	Val	Gln	His	Arg	Thr	Val	Ala	Gly	Val	Leu	Ser	Ser	Thr	Phe	Trp	
				285					290							
aca	ggg	aac	atg	atg	ctg	ctg	aca	ctg	ttt	ggg	tac	ctg	ata	gtg	gac	964
Thr	Gly	Gly	Val	Met	Leu	Leu	Ala	Leu	Val	Gly	Tyr	Leu	Ile	Arg	Asp	
				300					305							
tgg	cga	tgg	ctt	ctg	cta	gct	gtc	acc	ctg	ccg	tgt	ggc	cca	ggc	atc	1012
Trp	Arg	Trp	Leu	Leu	Leu	Ala	Val	Thr	Leu	Pro	Cys	Ala	Pro	Gly	Ile	
				320					325							
ctc	agg	ctc	tgg	tgg	gtg	ccg	gag	tct	gca	ggc	tgg	ctt	ctg	acc	caa	1060
Leu	Ser	Leu	Trp	Trp	Val	Pro	Glu	Ser	Ala	Arg	Trp	Leu	Leu	Thr	Ala	
				330					340							
ggg	cac	atg	aaa	gag	gac	cac	agg	tac	tgg	atc	caa	tgt	gac	agg	ctt	1108
Gly	His	Val	Lys	Gln	Ala	His	Arg	Tyr	Leu	Leu	His	Lys	Ala</			

464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

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Thr Ser Met Pro Ser Phe Trp Ser Leu Glu Ala Tyr Tyr Thr Asn Tyr
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Phe Val Ser Asn Ile Tyr Leu Ser Pro Arg Tyr Leu Gly Asn Ser Pro
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Tyr Asp Ile Ala Leu Val Lys Leu Ser Ala Pro Val Thr Tyr Thr Lys
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His Ile Glu Pro Ile Cys Leu Val Ala Ser Thr Phe Glu Phe Val Asn
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Arg Thr Asp Cys Trp Val Thr Gly Trp Gly Tyr Ile Lys Glu Asn Glu
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Asn Leu Ser Ser Pro His Thr Leu Glu Glu Val Val Val Ala Ile Ile
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Asn Asn Ser Met Cys Asn His Leu Phe Leu Lys Tyr Ser Asn Asn Lys
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Asp Ile Phe Gly Asp Met Val Lys Ala Gly Asn Ala His Gly Gly Lys
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Asp Ala Tyr Phe Gly Asp Ser Gly Pro Leu Ala Cys Asn Lys Asn
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Gly Leu Trp Tyr Glu Ile Gly Val Val Ser Thr Gly Val Gly Tyr Gly
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Arg Pro Asn Arg Pro Gly Val Tyr Thr Asn Ile Ser His His Phe Glu
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Trp Ile Glu Lys Leu Met Ala His Ser Gly Met Ser Glu Ser Arg Pro
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361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380
Ser Trp Pro Leu Ile Pro Ile Pro Leu Lys Trp Ala Leu Ile Leu Leu
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381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400
Gly Pro Val

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[illegible]

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 Arg Arg Gln Ala Asp Gln Thr His Ala Gln Asn Phe Ser Ser Ala Val
 195 200 205
 Lys Ser Pro Val Gln Val Ile Leu Leu Arg Ala Leu Ala Phe Leu Ala
 210 215 220
 Cys Ala Phe Leu Leu Thr Thr Ala Leu Tyr Gly Ala Ser Gly His Ile
 225 230 235 240
 Ala Pro Gly Thr Thr Val Pro Leu Ala Leu Pro Pro Gly Gly Asn Gly
 245 250 255
 Ser Ala Thr Pro Asp Asn Gly Thr Thr Pro Gly Ala Glu Gly Trp Arg
 260 265 270
 Gln Leu Leu Gly Leu Leu Pro Glu His Met Ala Glu Lys Leu Cys Ala
 275 280 285
 Ala Trp Ala Phe Gly Gln Ser His Gln Thr Gly Val Val Ala Leu Gly
 290 295 300
 Leu Leu Thr Cys Leu Leu Ala Met Leu Leu Ala Gly Arg Ile Arg Leu
 305 310 315 320
 Arg Arg Ile Asp Ala Phe Cys Thr Lys Leu Trp Ala Leu Leu Leu Gly
 325 330 335
 Leu His Leu Ala Ala Gln His Leu Gln Ala Ala Ser Fr Ser Trp Leu
 340 345 350
 Asp Thr Leu Lys Ile Ser Thr Thr Ser Leu Cys Cys Leu Val Gly Ile
 355 360 365
 Thr Ala Ala Val Ala Thr Arg Lys Ala Thr Gly Fr Arg Arg Ile Arg
 370 375 380
 Ile Arg Arg Ser Gln Lys Gln Pro
 385 390

*2121-62
 *2122-447
 *2123-187
 *2124-Home sapiens

*2125-62
 Met Ala Leu Trp Arg Gly Ser Ala Tyr Ala Gly His Leu Ala Leu Ala
 1 5
 Val Gly Cys Val Phe Leu Leu Gln Pro His Leu Fr Gly Arg Ala Leu
 10 15
 Arg Ser Leu Trp Ser Ser Leu Tyr Leu Gly Pro Ala Fr Ala Ile Fr
 20 25
 Gly Fr Val Ser Pro His Gly Arg Leu Ala Ala Ala Trp Asp Ala Leu
 30 35
 Ile Val Arg Pro Val Arg Arg Trp Arg Arg Val Ala Val Gly Val Arg
 40 45
 Ala Tyr Val Asp Val Val Leu Ser Gly Val Lys Leu Leu Ala Arg Leu
 50 55
 Gly Leu Ser Fr Gly Asn Gly Lys Asp His Ser Ile Leu His Ser Arg
 60 65
 Asn Asp Leu Gln Gln Ala Phe Ile His Phe Met Trp Lys Gly Ala Ala
 70 75
 Ala Glu Arg Phe Phe Ser Asp Lys Glu Thr Phe His Asp Ile Ala Gln
 80 85
 Val Ala Ser Gln Phe Pro Gly Ala Gln His Tyr Val Gly Gly Asn Ala
 90 95
 Ala Leu Ile Gly His Lys Phe Ala Ala Asn Ser Arg Leu Lys Val Leu
 100 105
 Leu Cys Gly Pro Val Gly Fr Arg Leu His His Leu Leu Asp Asp Arg
 110 115
 Val His Val Fr Pro Gln Ser Leu His His Val Arg Gln His His Leu
 120 125

Ile Leu Glu Tyr Glu Ala Gly His Glu Trp Gly Glu Leu Lys Ala Leu
 210 210 220
 His Ala Asn Arg Phe Ile Phe Ser His Asp Leu Ser Asn Gly Ala Met
 231 230 230
 Asn Met Leu Glu Val Phe Val Ser Ser Leu Glu Glu Ile His Pro Arg
 245 250
 Leu Val Val Leu Ser Gly Leu His Met Met Glu Gly Glu Ser Lys Val
 260 260 270
 Leu Glu Arg Lys Arg Leu Leu Glu Val Val Thr Ser Ile Ser Asp Leu
 270 280 280
 Pro Thr Gly Ile Pro Val His Leu Glu Leu Ala Ser Met Thr Asn Arg
 290 295 300
 Glu Leu Met Ser Ser Ile Val His Glu Glu Val Phe Pro Ala Val Thr
 310 310 320
 Ser Leu Gly Leu Asn Glu Glu Glu Leu Leu Phe Leu Thr Glu Ser Ala
 325 330 340
 Ser Gly Pro His Ser Ser Leu Ser Ser Trp Asn Gly Val Pro Asp Val
 340 340 350
 Gly Met Val Ser Asp Ile Leu Phe Trp Ile Leu Lys Glu His Gly Asn
 350 360 360
 Ser Lys Ser Arg Ala Ser Asp Leu Thr Arg Ile His Ile His Thr Leu
 370 370 380
 Val Tyr His Ile Leu Ala Thr Val Asp Gly His Trp Ala Asn Glu Leu
 380 390 400
 Ala Ala Val Ala Ala Gly Ala Arg Val Ala Gly Thr Glu Ala Lys Ala
 405 410 410
 Thr Glu Thr Ile Asp Thr Ser Arg Val Ser Leu Arg Ala Pro Glu Glu
 410 420 430
 Phe Met Thr Ser His Ser Glu Ala Gly Ser Arg Ile Val Leu Asn Pro
 440 440 450
 Asn Lys Pro Val Val Glu Trp His Arg Glu Gly Ile Ser Ile His Ile
 450 460 460
 Thr Pro Val Leu Val Cys Lys Asp Pro Ile Arg Thr Val Gly Leu Gly
 465 470 470 480
 Asp Ala Ile Ser Ala Glu Gly Leu Phe Tyr Ser Glu Val His Pro His
 485 490 490

Tyr

411-417

411-417

411-417

411-417

411-417

Met Leu Val His Leu Ile Arg Val Gly Ile Arg Gly Gly Ile Phe Pro
 1 1 1
 Gly Arg Leu Leu Pro Pro Leu Arg Ile Glu Thr Phe Ser Ala Val Arg
 2 2 2
 Tyr Ser Arg Gly Tyr Arg Ser Ser Ser Leu Leu Arg Ala Val Ala His
 3 3 3
 Leu Arg Ser Glu Leu Trp Ala His Leu Pro Arg Ala Pro Leu Ala Pro
 4 4 4
 Arg Trp Ser Pro Ser Ala Trp Cys Trp Val Gly Ala Leu Leu Gly
 5 5 5
 Pro Met Val Leu Ser Lys His Pro His Leu Cys Leu Val Ala Leu Cys
 6 6 6
 Glu Ala Glu Glu Ala Pro Pro Ala Ser Ser Thr Pro His Val Val Gly
 7 7 7
 Ser Arg Ile Asn Trp Tyr Leu Ile Trp His Ile Leu His Pro His Leu
 8 8 8
 Leu Val Leu Gly Val Ala Val Val Leu Ala Leu Gly Ala Arg Leu Val
 9 9 9

133 134 143
 Asp Val Gln Ile Pro Leu Leu Leu Gly Gln Leu Val Gln Val Val Ala
 147 150 155 160
 Lys Tyr Thr Arg Asp His Val Gly Ser Phe Met Thr Gln Ser Gln Asn
 165 170 175
 Leu Ser Thr His Leu Leu Ile Leu Tyr Gly Val Gln Gly Leu Leu Thr
 180 185 190
 Phe Gly Tyr Leu Val Leu Leu Ser His Val Gly Gln Arg Met Ala Val
 195 200 205
 Asp Met Arg Arg Ala Leu Phe Ser Ser Leu Leu Arg Tyr Lys Gln Pro
 210 215 220
 Gln Gly Ala Gln Leu Gly Gln Asp Ile Thr Phe Phe Asp Ala Asn Lys
 225 230 235
 Thr Gly Gln Leu Val Ser Arg Leu Thr Thr Asp Val Gln Gln Phe Lys
 240 245 250
 Ser Ser Phe Lys Leu Val Ile Ser Gln Gly Leu Arg Ser Lys Thr Gln
 255 260 265
 Val Ala Gly Tyr Leu Val Ser Leu Ser Met Leu Ser Thr Arg Leu Thr
 270 275 280
 Leu Leu Leu Met Val Ala Thr Phe Ala Leu Met Gly Val Arg Thr Leu
 285 290 295
 Met Gly Ser Gly Leu Arg Lys Leu Ser Cys Gln Tyr Gln Ala Gln Ile
 300 305 310
 Ala Arg Ala Met Gly Val Ala Asp Gln Ala Leu Gly Asn Val Arg Thr
 315 320 325
 Val Arg Ala Phe Ala Met His Gln Arg Gln Gln Gln Arg Tyr Gly Ala
 330 335 340
 Gln Leu Gln Ala Tyr Arg Tyr Arg Ala Gln Gln Leu Gly Arg Gly Ile
 345 350 355
 Ala Leu Phe Gln Gly Leu Ser Asn Ile Ala Phe Asn Tyr Met Val Leu
 360 365 370
 Gly Thr Leu Phe Ile Gly Gly Ser Leu Val Ala Gly Gln Gln Leu Thr
 375 380 385
 Gly Gly Asp Leu Met Ser Phe Leu Val Ala Ser Gln Thr Val Gln Arg
 390 395 400
 Leu 405 410 415

1111-64
 1111-64P
 1111-6PT
 1111-6HPT

1111-64
 Met Ile Pro Asn Gln His Arg Ala Gly Ala Gly Ser His Gln Ser Ala
 1 5 10
 Val Phe Arg Met Ala Val Leu Arg Thr Arg Leu Arg His Gln Leu Ile
 15 20 25
 Ser Ser Val Leu Ile Pro Phe Tyr Ala Lys Leu Val Val Gly Ser Val
 30 35 40
 Ala Ile Val Cys Phe Ala Arg Ser Tyr Asp Gly Arg Phe Val Ile Asp
 45 50 55
 Asp Ser Gln Ala Ile Val Asn Asn Lys Val Ala Gly Val Val Gly Arg
 60 65 70
 Ala Asp Leu Leu Cys Ala Leu Phe Phe Leu Leu Ser Phe Leu Gly Tyr
 75 80 85
 Tyr Lys Ala Phe Arg Gln Ser Asn Lys Gln Gly Ala His Ser Ser Thr
 90 95 100
 Phe Tyr Val Leu Leu Ser Ile Phe Leu Gly Ala Val Ala Ser Leu Tyr
 105 110 115
 Lys Gln Gln Gly Ile Thr Val Leu Gly Leu Asn Ala Val Phe Arg Ile
 120 125 130

Leu	Val	Ile	Gly	Lys	Phe	Asn	Val	Leu	Glu	Ile	Val	Gln	Lys	Val	Leu
145					150					155					16
His	Lys	Asp	Lys	Ser	Leu	Gln	Asn	Leu	Gly	Met	Leu	Arg	Asn	Gly	Gly
				165					170					175	
Leu	Leu	Phe	Arg	Met	Thr	Leu	Leu	Thr	Ser	Gly	Gly	Ala	Gly	Met	Leu
		180						185					190		
Tyr	Val	Arg	Trp	Arg	Ile	Met	Gly	Thr	Gly	Pro	Pro	Ala	Phe	Thr	Gln
	195					200						205			
Val	Asp	Asn	Pro	Ala	Ser	Phe	Ala	Asp	Ser	Met	Leu	Val	Arg	Ala	Val
	210					215					220				
Asn	Tyr	Asn	Tyr	Tyr	Tyr	Ser	Leu	Asn	Ala	Trp	Leu	Leu	Leu	Cys	Pro
225						230				235					240
Trp	Trp	Leu	Cys	Phe	Asp	Trp	Ser	Met	Gly	Cys	Ile	Pro	Leu	Ile	Lys
				245					250					255	
Ser	Ile	Ser	Asp	Trp	Arg	Val	Ile	Ala	Leu	Ala	Ala	Leu	Trp	Phe	Ser
		260				265						270			
Leu	Ile	Gly	Leu	Ile	Cys	Gln	Ala	Leu	Cys	Ser	Gln	Asp	Gly	His	Lys
	275					280						285			
Arg	Arg	Ile	Leu	Thr	Leu	Gly	Leu	Gly	Phe	Leu	Val	Ile	Trp	Phe	Leu
	290				295						300				
Pro	Ala	Ser	Asn	Leu	Phe	Phe	Arg	Val	Gly	Phe	Val	Val	Ala	His	Arg
	305				310					315					320
Val	Leu	Tyr	Leu	Pro	Ser	Ile	Gly	Tyr	Cys	Val	Leu	Leu	Thr	Phe	Gly
		325						330						335	
Phe	Gly	Ala	Leu	Ser	Lys	His	Thr	Lys	Lys	Lys	Lys	Leu	Ile	Ala	Ala
	340					345						350			
Val	Val	Leu	Gly	Ile	Leu	Phe	Ile	Asn	Thr	Leu	Arg	Cys	Val	Leu	Arg
	355					360						365			
Ser	Gly	Ala	Trp	Arg	Ser	Gln	Gln	Gln	Leu	Ile	Arg	Ser	Ala	Leu	Arg
	370				375					380					
Val	Lys	Pro	Leu	Asn	Ala	Lys	Val	His	Tyr	Asn	Ile	Gly	Lys	Asn	Leu
	385				390				395					400	
Ala	Asp	Lys	Gly	Asn	Gln	Thr	Ala	Ala	Ile	Arg	Tyr	Tyr	Arg	Gln	Ala
		405				410								415	
Val	Arg	Leu	Asn	Pro	Lys	Tyr	Val	His	Ala	Met	Asn	Asn	Leu	Gly	Asn
	420					425								430	
Ile	Leu	Lys	Gln	Arg	Asn	Gln	Leu	Gln	Ala	Gln	Ala	Leu	Leu	Leu	Ser
	435					440						445			
Leu	Ala	Val	Gln	Ile	Gln	Pro	Asp	Phe	Ala	Ala	Ala	Arg	Met	Asn	Leu
	450					455						460			
Gly	Ile	Val	Gln	Asn	Ser	Leu	Lys	Arg	Phe	His	Ala	Ala	Gln	Gln	Ser
	465				470					475					480
Tyr	Arg	Thr	Ala	Ile	Lys	His	Arg	Arg	Lys	Tyr	Pro	Asp	Cys	Tyr	Tyr
		485							490					495	
Asn	Leu	Gly	Arg	Leu	Tyr	Ala	Asp	Leu	Asn	Arg	His	Val	Asp	Ala	Leu
		500						505							
Asn	Ala	Trp	Arg	Asn	Ala	Thr	Val	Leu	Lys	Pro	His	His	Ser	Leu	Ala
	510							515							
Trp	Asn	Asn	Met	Ile	Ile	Leu	Leu	Asp	Asn	Thr	Gly	Asn	Leu	Ala	Gln
	520					525						530			
Ala	Gln	Ala	Val	Gly	Arg	Gln	Ala	Leu	Gln	Leu	Ile	Pro	Asn	Asp	His
	535				540					545					550
Ser	Leu	Met	Phe	Ser	Leu	Ala	Asn	Val	Leu	Gly	Lys	Ser	Gln	Lys	Tyr
		555						560						565	
Lys	Gln	Ser	Gln	Ala	Leu	Phe	Leu	Lys	Ala	Ile	Lys	Ala	Asn	Pro	Asn
	570					575						580			
Ala	Ala	Ser	Tyr	His	Gly	Asn	Leu	Ala	Val	Leu	Tyr	His	Arg	Trp	Gly
	585					590						595			
His	Leu	Arg	Leu	Ala	Lys	Lys	His	Tyr	Ala	Ile	Ser	Leu	Gln	Leu	Asp
	600					605						610			
Pro	Thr	Ala	Ser	Gly	Thr	Lys	Gln	Asn	Tyr	Gly	Leu	Leu	Arg	Arg	Lys

625 630 635 64
 Leu Ala Leu Met Gln Lys Lys Ala Val
 648

<212> 61
 <212> 93
 <212> FRT
 <212> Homo sapiens

<400> 61
 Met Ile His Leu Gly His Ile Leu Phe Leu Leu Leu Leu Pro Val Ala
 1 5 10 15
 Ala Ala Gln Thr Thr Pro Gly Glu Arg Ser Ser Leu Pro Ala Phe Tyr
 20 25 30
 Pro Gly Thr Ser Gly Ser Cys Ser Gly Cys Gly Ser Leu Ser Leu Pro
 35 40 45
 Leu Leu Ala Gly Leu Val Ala Ala Asp Ala Val Ala Ser Leu Leu Ile
 50 55 60
 Val Gly Ala Val Ile Leu Cys Ala Arg Pro Arg Arg Ser Pro Ala Val
 65 70 75
 Gln Asp Gly Lys Val Tyr Ile Asn Met Pro Gly Arg Gly
 80 85

<212> 61
 <212> 41
 <212> FRT
 <212> Homo sapiens

<400> 61
 Met Gly Ser Trp Ala Ala Val Asn Gly Ile Trp Val Ala Leu Pro Val
 1 5 10 15
 Val Val Lys Glu Leu Pro Gln Gly Trp Ser Leu Pro Ser Tyr Val Ser
 20 25 30
 Val Leu Val Ala Leu Gly Asn Leu Gly Leu Leu Val Val Thr Leu Trp
 35 40 45
 Arg Arg Leu Ala Pro Gly Lys Asp Ala Val Val Pro Ile Arg Val Val
 50 55 60
 Val Val Leu Gly Met Val Gly Thr Ala Leu Leu Ala Ser Leu Trp His
 65 70 75
 His Val Ala Arg Val Ala Gly Val Leu His Ser Val Ala Pro Leu Ala
 80 85 90
 Leu Ala Phe Val Leu Ala Leu Ala Cys Cys Ala Ser Asn Val Thr Phe
 95 100 105
 Leu Pro Phe Leu Ser His Leu Pro Pro Arg His Leu Arg Ser Phe Pro
 110 115 120
 Leu Gly Gln Gly Leu Ser Ala Leu Leu Pro Cys Val Leu Ala Leu Val
 125 130 135
 Val Gly Val Gly Arg Leu Gln Cys Ser Ser Ala Ser Ile Asn Gly Thr
 140 145 150
 Pro Gly Pro Pro Leu Asp Phe Leu Ala Arg Phe Pro Ala Ser Thr Phe
 155 160 165
 Phe Trp Ala Leu Thr Ala Leu Leu Val Ala Ser Ala Ala Ala Phe Gln
 170 175 180
 Gly Leu Leu Leu Leu Pro Pro Pro Ser Val Pro Thr Gly Glu
 185 190 195
 Leu Gly Ser Gly Leu Gln Val Gly Ala Pro Gly Ala Val Gln Gln Val
 200 205 210
 His Gln Ser Ser Pro Leu Gln His Pro Pro Ser His Ala Ala Gly Thr
 215 220 225
 His Pro Gly His Arg Pro Lys Ala Tyr His Leu Leu Ser Ala Arg Ser
 230 235 240

Ala Cys Leu Leu Gly Leu Leu Ala Ala Thr Asn Ala Leu Thr Asn Gly
 260 265
 Val Leu Pro Ala Val Gln Ser Phe Ser Cys Leu Pro Tyr Gly Asn Leu
 275 280 285
 Ala Tyr His Leu Ala Val Val Leu Gly Ser Ala Ala Asn Pro Leu Ala
 290 295 300
 Cys Phe Leu Ala Met Gly Val Leu Cys Arg Ser Leu Ala Gly Leu Gly
 305 310 315
 Gly Leu Ser Leu Leu Gly Val Phe Cys Gly Gly Tyr Leu Met Ala Leu
 325 330 335
 Ala Val Leu Ser Pro Cys Pro Pro Leu Val Gly Thr Ser Ala Gly Val
 340 345 350
 Val Leu Val Val Leu Ser Trp Val Leu Cys Leu Gly Val Phe Ser Tyr
 355 360 365
 Val Lys Val Ala Ala Ser Ser Leu Leu His Gly Gly Gly Arg Pro Ala
 370 375 380
 Leu Leu Ala Ala Gly Val Ala Ile Gln Val Gly Ser Leu Leu Gly Ala
 385 390 395
 Val Ala Met Phe Pro Pro Thr Ser Ile Tyr His Val Phe His Leu Asn
 400 405 410
 Lys Asp Cys Ala Asp Pro Cys Asp Ser
 415 420

<210> 67
 <211> 149
 <212> PRT
 <213> Homo sapiens

Met Ala Thr Leu Tyr Arg Val Pro Phe Leu Val Leu Gly Tyr Ser Asn
 1 11
 Leu Lys Leu Lys Lys Pro Pro Trp Leu His Met Pro Ser Ala Met Thr
 22 31
 Val Tyr Ala Leu Val Val Val Ser Tyr Phe Leu Ile Thr Gly Gly Ile
 32 41 48
 Ile Tyr Asp Val Ile Val Glu Pro Phe Leu Val Gly Ser Met Thr Arg
 51 60
 Glu His Gly His Gln Arg Pro Val Ala Ile Leu Ala Tyr Arg Val Asn
 69 78
 Gly Gln Tyr Ile Met Ala Gly Leu Ala Ser Ser Phe Leu Phe Thr Met
 87 96
 Gly Gly Leu Gly Phe Ile Ile Leu Asp Arg Ser Asn Ala Ile Asn Ile
 105 114 121
 Ser Lys Leu Asn Arg Phe Leu Leu Leu Phe Ile Gly Phe Val Tyr Val
 122 131 138
 Leu Leu Ser Phe Phe Met Ala Arg Val Phe Met Arg Met Lys Leu Ile
 139 148
 Gly Tyr Leu Met Gly
 149

<210> 68
 <211> 396
 <212> PRT
 <213> Homo sapiens

Met Ala Met Ile Gln Leu Gly Phe Gly Arg Gln Asn Phe His Pro Leu
 1 11
 Lys Arg Lys Ser Ser Leu Leu Leu Lys Leu Ile Ala Val Val Ile Ala
 20 29
 Val Leu Leu Phe Lys His Phe Leu Ile Tyr Tyr Leu Ala Ile Ile Ile
 38 47

30 40 40
 Cys Asn Trp Pro Glu Val Lys Thr Thr Ala Ser Asp Gly Glu Glu Thr
 50 55 60
 Thr Arg Glu Pro Val Leu Lys Ala Met Phe Leu Ala Asp Thr His Leu
 65 70 75 80
 Leu Gly Glu Phe Leu Gly His Trp Leu Asp Lys Leu Arg Arg Glu Trp
 85 90 95
 Glu Met Glu Arg Ala Phe Glu Thr Ala Leu Trp Leu Leu Glu Pro Glu
 100 105 110 115
 Val Val Ile Ile Leu Gly Asp Ile Ile Asp Glu Gly Lys Trp Ser Thr
 115 120 125 130
 Pro Glu Ala Trp Ala Asp Asp Val Glu Arg Phe Glu Lys Met Phe Arg
 130 135 140
 His Pro Ser His Val Glu Leu Lys Val Val Ala Gly Asn His Asp Ile
 145 150 155 160
 Gly Phe His Tyr Glu Met Asn Thr Tyr Lys Val Glu Arg Phe His Lys
 165 170 175 180
 Val Phe Ser Ser Glu Arg Leu Phe Ser Trp Lys Gly Ile Asn Phe Val
 185 190 195 200
 Met Val Arg Ser Val Ala Leu Asn Gly Asp Gly Lys Gly Ile Tyr Ser
 205 210 215 220
 Glu Ile Glu Ala Glu Leu Ile Ile Val Ser His Arg Leu Asn Tyr Ser
 225 230 235 240
 Arg Glu Ala Arg Gly Ser Ser Arg Cys Gly Pro Gly Phe Leu Leu Pro
 245 250 255 260
 Thr Ser Ala Pro Val Leu Leu Glu His Tyr Pro Leu Tyr Arg Arg Ser
 265 270 275 280
 Asp Ala Asn Cys Ser Gly His Asn Ala Ala Pro Ala His His Arg Asp
 285 290 295 300
 Ile Ile Ile Lys Glu Asn Tyr Asp Val Leu Ser Arg His Ala Ser His
 305 310 315 320
 Lys Leu Leu Trp Trp Leu Glu Pro Arg Leu Val Leu Ser Gly His Thr
 325 330 335 340
 His Ser Ala Cys Glu Val His His Gly Gly Arg Val Pro Glu Leu Ser
 345 350 355 360
 Val Pro Ser Ile Ser Trp Arg Asn Arg Asn Asn Pro Ser Asn Ile Met
 365 370 375 380
 Gly Ser Ile Ser Pro Thr Asp Tyr Thr Leu Ser Lys Tyr Tyr Leu Ser
 385 390 395 400
 Arg His Arg Val Val Leu Ile Ile Tyr Tyr Gly Val Val Gly Ile Leu
 405 410 415 420
 Val Val Leu Thr Leu Thr His Ile Gly Leu Leu Ala Ser Pro Phe Leu
 425 430 435 440
 Ser Gly Leu Asn Leu Leu Gly Lys Arg Lys Thr Ala
 445 450 455 460

4110-40
 4110-40
 4110-40
 4110-40

4400-60
 Met Ile Arg Glu Glu Arg Ser Thr Ser Tyr Glu Glu Leu Ser Glu Glu
 1 5 10 15
 Leu Val Glu Val Val Glu Asn Ser Glu Leu Ala Asp Glu Glu Asp Lys
 20 25 30
 Glu Thr Val Arg Val Glu Gly Pro Gly Ile Leu Pro Gly Leu Asp Ser
 35 40 45
 Glu Ser Ala Ser Ser Ser Ile Arg Phe Ser Tyr Ala Tyr Leu Lys Asn
 50 55 60
 Val Phe Ser Val Leu Leu Ile Ile Ile Tyr Leu Leu Leu Met Ala Val

60 70 75 80
 Ala Val Pro Leu Val Tyr Arg Thr Ile Thr Asp Phe Arg Ala Lys Ser
 85
 Lys His Pro Val Met Ser Val Ser Tyr Lys Glu Val Asp Arg Tyr Arg
 100 105 110 115
 Ala Pro Gly Ile Ala Leu Tyr Pro Gly Gln Ala Gln Leu Leu Ser Tyr
 115 120 125
 Lys His His Tyr Glu Val Ile Pro Pro Leu Thr Ser Pro Gly Gln Ile
 130 135 140
 Gly Asp Met Asn Cys Thr Thr Gln Arg Ile Asn Tyr Thr Asp Phe Ile
 145 150 155
 Ser Asn Gln Thr Val Lys Ser Ala Leu Ile Val Gln Gly Pro Arg Gln
 160 165 170 175
 Val Lys Lys Arg Gln Leu Val Phe Leu Gln Phe Arg Leu Asn Lys Ser
 180 185 190
 Ser Glu Asp Phe Ser Ala Ile Asp Tyr Leu Leu Phe Ser Ser Phe Ala
 195 200 205
 Gln Phe Leu Gln Ser Pro Asn Arg Val Lys Phe Met Gln Ala Tyr His
 210 215 220
 Ser Ala Tyr Ser Ser Thr Lys Ile Ser Gly Gly Phe Arg Thr Thr Val
 225 230 235 240
 Lys Met Ser Leu Val Lys Thr Lys Gln Gln Asp Gly Arg Gln Ala Val
 245 250 255
 Gln Ile Arg Gln Gln Thr Ser Val Val Asn Tyr Ile Asp Gln Arg Ile
 260 265 270
 Ala Ala Lys Lys Ser Ala Gln Leu Phe Ile Val Val Phe Thr Tyr
 275 280 285
 Asp Ile Phe Ile Gln Lys Val Gln Asp Ile Val Thr Ala Arg Ile Thr
 290 295 300
 Asn Thr Ile Ala Leu Leu Cys Gly Ala Ile Leu Ala Leu Ile Lys Ala
 305 310 315 320
 Ala Ala Pro Ala Lys Leu Ser Ile Lys Trp Met Ile Lys Ile Arg Lys
 325 330 335
 Arg Tyr Leu Lys Arg Arg Gly Gln Ala Thr Ser His Ile Ser
 340 345 350

411-71
 411-133
 411-157
 411-187

440-71
 Met Thr Ile His Ile Leu Ile Leu Leu Leu Leu Leu Ala His Ser Arg
 1 5 10
 Gln His Asp Leu Asp Arg Ala Ala Arg Arg Gly Gln His Thr Val Ile
 15 20 25
 Gln His Arg His His Val Tyr Tyr Leu Gly Val Tyr Arg His His Arg
 30 35 40
 Leu Ala Glu Ile Ile Tyr Trp Ile Arg Tyr Leu His Gln Arg Ala Ile
 45 50 55
 Gly Glu Gly His Pro Arg Ala Pro Gly Pro Leu Gln Leu Ile Ala Ile
 60 65 70
 Pro Val Ala Arg Gly Gly Ser Pro Ala Arg Phe Pro Gly Ile Arg Arg
 75 80 85
 Ala Ala Arg His Leu Ala Gln Cys Pro Ala Arg Trp Val Thr Ser His
 90 95 100
 Thr Ala Arg Ile Leu Leu Gly Phe Ser Leu Pro Ile Tyr Met Leu His
 105 110 115
 Leu Leu Leu His Ile Ser Ser Ile Leu Thr Pro Ala Pro Arg Thr Val
 120 125 130
 Pro His Ser Ile Ser Ile Gly Tyr Arg

...the ...

[illegible][illegible]

A 01179 IL
A 01180 209
A 01181 DNA
A 01182 Heme and Porphyrins

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ (Probability of getting two heads)
 2. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ (Probability of getting two tails)
 3. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ (Probability of getting one head and one tail)
 4. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ (Probability of getting one tail and one head)

$$I_{\alpha}^{\beta} \frac{1}{x} = \frac{1}{x} \frac{\Gamma(\beta)}{\Gamma(\beta - \alpha)} I_{\alpha}^{\beta - \alpha} \frac{1}{x} = \frac{1}{x} \frac{\Gamma(\beta)}{\Gamma(\beta - \alpha)} \frac{\Gamma(\beta - \alpha)}{\Gamma(\beta - \alpha - \alpha)} I_{\alpha}^{\beta - \alpha - \alpha} \frac{1}{x} = \dots$$

74

$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

1. *Species*: *...*
 2. *Genus*: *...*
 3. *Family*: *...*
 4. *Order*: *...*
 5. *Class*: *...*
 6. *Phylum*: *...*
 7. *Kingdom*: *...*
 8. *Domain*: *...*

400. 75

[illegible][illegible]

\angle

[illegible]

• 1997	• 1998	• 1999	• 2000	• 2001	• 2002	• 2003	• 2004	• 2005	• 2006	• 2007	• 2008	• 2009	• 2010	• 2011	• 2012	• 2013	• 2014	• 2015	• 2016	• 2017	• 2018	• 2019	• 2020	• 2021	• 2022	• 2023	• 2024	• 2025	• 2026	• 2027	• 2028	• 2029	• 2030	• 2031	• 2032	• 2033	• 2034	• 2035	• 2036	• 2037	• 2038	• 2039	• 2040	• 2041	• 2042	• 2043	• 2044	• 2045	• 2046	• 2047	• 2048	• 2049	• 2050	• 2051	• 2052	• 2053	• 2054	• 2055	• 2056	• 2057	• 2058	• 2059	• 2060	• 2061	• 2062	• 2063	• 2064	• 2065	• 2066	• 2067	• 2068	• 2069	• 2070	• 2071	• 2072	• 2073	• 2074	• 2075	• 2076	• 2077	• 2078	• 2079	• 2080	• 2081	• 2082	• 2083	• 2084	• 2085	• 2086	• 2087	• 2088	• 2089	• 2090	• 2091	• 2092	• 2093	• 2094	• 2095	• 2096	• 2097	• 2098	• 2099	• 2100	• 2101	• 2102	• 2103	• 2104	• 2105	• 2106	• 2107	• 2108	• 2109	• 2110	• 2111	• 2112	• 2113	• 2114	• 2115	• 2116	• 2117	• 2118	• 2119	• 2120	• 2121	• 2122	• 2123	• 2124	• 2125	• 2126	• 2127	• 2128	• 2129	• 2130	• 2131	• 2132	• 2133	• 2134	• 2135	• 2136	• 2137	• 2138	• 2139	• 2140	• 2141	• 2142	• 2143	• 2144	• 2145	• 2146	• 2147	• 2148	• 2149	• 2150	• 2151	• 2152	• 2153	• 2154	• 2155	• 2156	• 2157	• 2158	• 2159	• 2160	• 2161	• 2162	• 2163	• 2164	• 2165	• 2166	• 2167	• 2168	• 2169	• 2170	• 2171	• 2172	• 2173	• 2174	• 2175	• 2176	• 2177	• 2178	• 2179	• 2180	• 2181	• 2182	• 2183	• 2184	• 2185	• 2186	• 2187	• 2188	• 2189	• 2190	• 2191	• 2192	• 2193	• 2194	• 2195	• 2196	• 2197	• 2198	• 2199	• 2200	• 2201	• 2202	• 2203	• 2204	• 2205	• 2206	• 2207	• 2208	• 2209	• 2210	• 2211	• 2212	• 2213	• 2214	• 2215	• 2216	• 2217	• 2218	• 2219	• 2220	• 2221	• 2222	• 2223	• 2224	• 2225	• 2226	• 2227	• 2228	• 2229	• 2230	• 2231	• 2232	• 2233	• 2234	• 2235	• 2236	• 2237	• 2238	• 2239	• 2240	• 2241	• 2242	• 2243	• 2244	• 2245	• 2246	• 2247	• 2248	• 2249	• 2250	• 2251	• 2252	• 2253	• 2254	• 2255	• 2256	• 2257	• 2258	• 2259	• 2260	• 2261	• 2262	• 2263	• 2264	• 2265	• 2266	• 2267	• 2268	• 2269	• 2270	• 2271	• 2272	• 2273	• 2274	• 2275	• 2276	• 2277	• 2278	• 2279	• 2280	• 2281	• 2282	• 2283	• 2284	• 2285	• 2286	• 2287	• 2288	• 2289	• 2290	• 2291	• 2292	• 2293	• 2294	• 2295	• 2296	• 2297	• 2298	• 2299	• 2300	• 2301	• 2302	• 2303	• 2304	• 2305	• 2306	• 2307	• 2308	• 2309	• 2310	• 2311	• 2312	• 2313	• 2314	• 2315	• 2316	• 2317	• 2318	• 2319	• 2320	• 2321	• 2322	• 2323	• 2324	• 2325	• 2326	• 2327	• 2328	• 2329	• 2330	• 2331	• 2332	• 2333	• 2334	• 2335	• 2336	• 233
--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	-------

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | His | Tyr | Val | Gly | Gly | Asn | Ala | Ala | Leu | Ile | Gly | Gln | Lys | Phe | Ala | |
| 151 | | | | | | | 160 | | | | 165 | | | | | |
| 152 | 153 | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 |
| Ala | Asn | Ser | Asp | Leu | Lys | Val | Leu | Leu | Cys | Gly | Pro | Val | Gly | Ile | Pro | Arg |
| 170 | | | | | | | 175 | | | | 180 | | | | | |
| 181 | 182 | 183 | 184 | 185 | 186 | 187 | 188 | 189 | 190 | 191 | 192 | 193 | 194 | 195 | 196 | 197 |
| Leu | His | Glu | Leu | Leu | Asp | Asp | Asn | Val | Phe | Val | Pro | Ile | Gln | Ser | Leu | |
| 198 | | | | | | | 199 | | | | 200 | | | | | |
| 201 | 202 | 203 | 204 | 205 | 206 | 207 | 208 | 209 | 210 | 211 | 212 | 213 | 214 | 215 | 216 | 217 |
| Gln | Glu | Val | Asp | Glu | Phe | His | Leu | Ile | Leu | Glu | Tyr | Gln | Ala | Gly | His | |
| 218 | | | | | | | 219 | | | | 220 | | | | | |
| 221 | 222 | 223 | 224 | 225 | 226 | 227 | 228 | 229 | 230 | 231 | 232 | 233 | 234 | 235 | 236 | 237 |
| Glu | Trp | Gly | Gln | Leu | Lys | Ala | Pro | His | Ala | Asn | Arg | Phe | Ile | Phe | Ser | |
| 238 | | | | | | | 239 | | | | 240 | | | | | |
| 241 | 242 | 243 | 244 | 245 | 246 | 247 | 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | 257 |
| His | Asp | Leu | Ser | Asn | Gly | Ala | Met | Asn | Met | Leu | Glu | Val | Ile | Val | Ser | |
| 258 | | | | | | | 259 | | | | 260 | | | | | |
| 261 | 262 | 263 | 264 | 265 | 266 | 267 | 268 | 269 | 270 | 271 | 272 | 273 | 274 | 275 | 276 | 277 |
| Ser | Leu | Gln | Glu | Phe | Gln | Pro | Asp | Leu | Val | Val | Leu | Ser | Gly | Ile | His | |
| 278 | | | | | | | 279 | | | | 280 | | | | | |
| 281 | 282 | 283 | 284 | 285 | 286 | 287 | 288 | 289 | 290 | 291 | 292 | 293 | 294 | 295 | 296 | 297 |
| Met | Met | Glu | Gly | Gln | Ser | Lys | Glu | Leu | Gln | Arg | Lys | Arg | Leu | Leu | Glu | |
| 298 | | | | | | | 299 | | | | 300 | | | | | |
| 301 | 302 | 303 | 304 | 305 | 306 | 307 | 308 | 309 | 310 | 311 | 312 | 313 | 314 | 315 | 316 | 317 |
| Val | Val | Thr | Ser | Ile | Ser | Asp | Ile | Pro | Thr | Gly | Ile | Ile | Val | His | Leu | |
| 318 | | | | | | | 319 | | | | 320 | | | | | |
| 321 | 322 | 323 | 324 | 325 | 326 | 327 | 328 | 329 | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 |
| His | Leu | Ala | Ser | Met | Thr | Asn | Arg | Gln | Leu | Met | Ser | Ser | Ile | Val | His | |
| 338 | | | | | | | 339 | | | | 340 | | | | | |
| 341 | 342 | 343 | 344 | 345 | 346 | 347 | 348 | 349 | 350 | 351 | 352 | 353 | 354 | 355 | 356 | 357 |
| Gln | Gln | Val | Phe | Pro | Ala | Val | Thr | Ser | Leu | Gly | Leu | Asn | Glu | Asn | Glu | |
| 358 | | | | | | | 359 | | | | 360 | | | | | |
| 361 | 362 | 363 | 364 | 365 | 366 | 367 | 368 | 369 | 370 | 371 | 372 | 373 | 374 | 375 | 376 | 377 |
| Arg | Leu | Phe | Leu | Thr | Gln | Ser | Ala | Ser | Gly | Pro | His | Ser | Ser | Leu | Pro | |
| 378 | | | | | | | 379 | | | | 380 | | | | | |
| 381 | 382 | 383 | 384 | 385 | 386 | 387 | 388 | 389 | 390 | 391 | 392 | 393 | 394 | 395 | 396 | 397 |
| Ser | Trp | Asn | Gly | Val | Pro | Asp | Val | Gly | Met | Val | Ser | Asp | Ile | Leu | Ile | |
| 398 | | | | | | | 399 | | | | 400 | | | | | |
| 401 | 402 | 403 | 404 | 405 | 406 | 407 | 408 | 409 | 410 | 411 | 412 | 413 | 414 | 415 | 416 | 417 |
| Trp | Ile | Leu | Lys | Glu | His | Gly | Arg | Ser | Lys | Ser | Arg | Ala | Ser | Arg | Leu | |
| 418 | | | | | | | 419 | | | | 420 | | | | | |
| 421 | 422 | 423 | 424 | 425 | 426 | 427 | 428 | 429 | 430 | 431 | 432 | 433 | 434 | 435 | 436 | 437 |
| Thr | Arg | Ile | His | Phe | His | Thr | Leu | Val | Tyr | His | Ile | Leu | Ala | Thr | Val | |
| 438 | | | | | | | 439 | | | | 440 | | | | | |
| 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | 449 | 450 | 451 | 452 | 453 | 454 | 455 | 456 | 457 |
| Asp | Gly | His | Trp | Ala | Asn | Gln | Leu | Ala | Ala | Val | Ala | Ala | Gly | Ala | Arg | |
| 458 | | | | | | | 459 | | | | 460 | | | | | |
| 461 | 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | 471 | 472 | 473 | 474 | 475 | 476 | 477 |
| Val | Ala | Gly | Thr | Gln | Ala | Tyr | Ala | Thr | Gln | Thr | Ile | Arg | Thr | Ser | Arg | |
| 478 | | | | | | | 479 | | | | 480 | | | | | |
| 481 | 482 | 483 | 484 | 485 | 486 | 487 | 488 | 489 | 490 | 491 | 492 | 493 | 494 | 495 | 496 | 497 |
| Val | Ser | Leu | Arg | Ala | Pro | Gln | Glu | Phe | Met | Thr | Ser | His | Ser | Ala | Ala | |
| 498 | | | | | | | 499 | | | | 500 | | | | | |
| 501 | 502 | 503 | 504 | 505 | 506 | 507 | 508 | 509 | 510 | 511 | 512 | 513 | 514 | 515 | 516 | 517 |
| Gly | Ser | Arg | Ile | Val | Leu | Asn | Pro | Asn | Lys | Pro | Val | Val | Glu | Trp | His | |
| 518 | | | | | | | 519 | | | | 520 | | | | | |
| 521 | 522 | 523 | 524 | 525 | 526 | 527 | 528 | 529 | 530 | 531 | 532 | 533 | 534 | 535 | 536 | 537 |
| Arg | Glu | Gly | Ile | Ser | His | Pro | Thr | Pro | Val | Leu | Val | Gly | Lys | Asp | | |
| 538 | | | | | | | 539 | | | | 540 | | | | | |
| 541 | 542 | 543 | 544 | 545 | 546 | 547 | 548 | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 |
| Pro | Ile | Arg | Thr | Val | Gly | Leu | Gly | Arg | Ala | Ile | Ser | Ala | Glu | Gly | Leu | |

$$E_{\text{eff}} = \frac{1}{2} \left(\frac{1}{\epsilon_0} + \frac{1}{\epsilon_0} \right) = \frac{1}{\epsilon_0} \quad \text{for } \epsilon_0 = 1$$
2.1.1. *CS*

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400 24

82

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 114 | 254 | 260 | 265 | 115 | | | | | | | | | | | | |
| Ala | Leu | Trp | Phe | Cys | Leu | Ile | Gly | Leu | Ile | Cys | Gln | Ala | Leu | Cys | Leu | 116 |
| 170 | 270 | 275 | 280 | 117 | | | | | | | | | | | | |
| Glu | Asp | Gly | His | Lys | Arg | Arg | Ile | Leu | Thr | Leu | Gly | Leu | Gly | Ile | Leu | 118 |
| 285 | 290 | 295 | 300 | 119 | | | | | | | | | | | | |
| Val | Ile | Ile | Phe | Phe | Leu | Pro | Ala | Ser | Asn | Leu | Ile | Phe | Arg | Val | Gly | 120 |
| 305 | 310 | 315 | 320 | 121 | | | | | | | | | | | | |
| Val | Val | Ala | Glu | Arg | Val | Leu | Tyr | Leu | Pro | Ser | Ile | Gly | Tyr | Cys | Val | 122 |
| 325 | 330 | 335 | 340 | 123 | | | | | | | | | | | | |
| Leu | Leu | Thr | Phe | Gly | Phe | Gly | Ala | Leu | Ser | Lys | His | Thr | Lys | Lys | Lys | 124 |
| 345 | 350 | 355 | 360 | 125 | | | | | | | | | | | | |
| Lys | Leu | Ile | Ala | Ala | Val | Val | Leu | Gly | Ile | Leu | Phe | Ile | Asn | Thr | Leu | 126 |
| 365 | 370 | 375 | 380 | 127 | | | | | | | | | | | | |
| Arg | Tyr | Val | Leu | Arg | Ser | Gly | Glu | Trp | Arg | Ser | Glu | Ala | Ala | Leu | Phe | 128 |
| 385 | 390 | 395 | 400 | 129 | | | | | | | | | | | | |
| Ala | Glu | Ile | Ala | Leu | Ser | Val | Cys | Pro | Leu | Asn | Ala | Lys | Val | His | Tyr | 130 |
| 405 | 410 | 415 | 420 | 131 | | | | | | | | | | | | |
| Ile | Gly | Lys | Asn | Leu | Ala | Asp | Lys | Gly | Asn | Gln | Thr | Ala | Ala | Ile | Arg | 132 |
| 425 | 430 | 435 | 440 | 133 | | | | | | | | | | | | |
| Tyr | Tyr | Arg | Glu | Ala | Val | Arg | Leu | Asn | Pro | Lys | Tyr | Val | His | Ala | Met | 134 |
| 445 | 450 | 455 | 460 | 135 | | | | | | | | | | | | |
| Asn | Asn | Leu | Gly | Asn | Ile | Leu | Lys | Glu | Arg | Asn | Glu | Leu | Glu | Glu | Ala | 136 |
| 465 | 470 | 475 | 480 | 137 | | | | | | | | | | | | |
| Glu | Glu | Ala | Leu | Leu | Pro | Leu | Ala | Val | Gln | Ile | Gln | Pro | Arg | Ile | Ala | 138 |
| 485 | 490 | 495 | 500 | 139 | | | | | | | | | | | | |
| Ala | Trp | Met | Asn | Leu | Gly | Ile | Val | Gln | Asn | Ser | Leu | Lys | Arg | Phe | Glu | 140 |
| 505 | 510 | 515 | 520 | 141 | | | | | | | | | | | | |
| Ala | Ala | Ala | Ala | Ala | Ser | Tyr | Arg | Thr | Ala | Ile | Lys | His | Arg | Arg | Lys | 142 |
| 525 | 530 | 535 | 540 | 143 | | | | | | | | | | | | |
| Pro | Asp | Tyr | Tyr | Tyr | Asn | Leu | Gly | Arg | Leu | Tyr | Ala | Arg | Leu | Asn | Arg | 144 |
| 545 | 550 | 555 | 560 | 145 | | | | | | | | | | | | |
| His | Val | Arg | Ala | Leu | Asn | Ala | Thr | Arg | Asn | Ala | Thr | Val | Leu | Lys | Pro | 146 |
| 565 | 570 | 575 | 580 | 147 | | | | | | | | | | | | |
| His | His | Ser | Leu | Ala | Trp | Asn | Asn | Met | Ile | Ile | Leu | Leu | Asp | Asn | Thr | 148 |
| 585 | 590 | 595 | 600 | 149 | | | | | | | | | | | | |
| Glu | Asn | Leu | Ala | Gln | Ala | Glu | Ala | Val | Gly | Arg | Glu | Ala | Leu | Glu | Leu | 150 |
| 605 | 610 | 615 | 620 | 151 | | | | | | | | | | | | |
| Ala | Pro | Arg | Arg | His | Ser | Leu | Met | Phe | Ser | Leu | Ala | Asn | Val | Leu | Gly | 152 |
| 625 | 630 | 635 | 640 | 153 | | | | | | | | | | | | |
| Lys | Leu | Ala | Lys | Lys | Thr | Ser | Ala | Leu | His | Leu | Lys | Ala | Leu | Lys | Ala | 154 |
| 645 | 650 | 655 | 660 | 155 | | | | | | | | | | | | |

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<11> 1712
<12> RNA
<13> Homo sapiens

<120>
<11> CDS
<12> (185)...(1457)

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tgggaagga acg agctgtg accttggcc tgaactggaa agcagagc ttatctgga
tggcagaccc caggcccgcc cgtcgggtgc tgaaccaccc acctgtggc accttggc
atg ggc ttc tgc ggc ggc ggc aat ggc atc tgc tgc ggc ttc tgc tgc
Met Gly Ser Trp Ala Ala Val Asn Gly Ile Trp Val His Leu Ile Val
1 5 10 15
tgc ggc aac aat att aca aac att tgc aac att aac att aac att aac
Val Val Lys His Leu Pro Gln Gly Trp Ser Leu Pro Ser Lys Val Ser
20 25 30 35
tgc ggc aac ggc att aac aac att ggc att aac att aac att aac att aac
Val Leu Val Ala Leu Gly Asn Leu Gly Leu Leu Val Val Ile Leu Trp
40 45
aac aac att aac att ggc att ggc att ggc att ggc att ggc att ggc
Asn Asn Leu Ala Pro Gly Lys Asp Gln Gln Val Pro Ile Arg Val Val
50 55 60
tgc ggc att att att att att att att att att att att att att att
His Val Leu Gly Met Val Gly Thr Ala Leu Ala Leu Ala Trp His
65 70 75 80
tgc ggc ggc att ggc att aac aac att att att att att att att att
His Val Ala Pro Val Ala Gly Gln Leu His Ser Val Ala Phe Leu Ala
85 90 95
tgc ggc att ggc att ggc att ggc att ggc att ggc att ggc att ggc
Leu Ala Phe Val Leu Ala Leu Ala Lys Lys Ala Ser Asn Val Thr Phe
100 105 110
tgc ggc att att att att att att att att att att att att att att
Leu Pro Phe Leu Ser His Leu Pro Pro Arg Phe Leu Asn Ser Phe Phe
115 120 125
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Gln Gly Val Gly Arg Leu Gln Lys Pro Pro Ala Pro Phe Asn Gly Thr
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Pro Gly Pro Pro Leu Arg Phe Leu Ala Arg Phe Pro Ala Ser Thr Phe
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Phe Trp Ala Leu Thr Ala Leu Leu Val Ala Ser Ala Ala Ala Phe Gln
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220 225 230
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Asn Ser His His His His His His His His His His His His His His
235 240 245 250 255 260 265 270 275 280 285 290 295 300

390 395
autatctatg gaaagagat ggaatttga tgaatata tttatgatt tttttttt 1117
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ser val val thr val val val val val val val val val val val 1124
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His Asp Lys His Thr Val Arg Val Gln Gly Pro Gly His Leu Pro Gly 1127
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thr val val val val val val val val val val val val val val 1128
Leu Asp Ser Thr Ser Ala Ser Ser Ser His Arg His Ser Lys Ala Tyr 1129
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gln val val val val val val val val val val val val val val 1130
Leu Lys Asn Val His Ser Val Leu Leu His His His Tyr Leu Leu Leu 1131
56 57 58 59 60 61 62 63 64 65 66 67 68 69 70
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Gln Lys Leu Lys His Pro Val Met Ser Val Ser Tyr Lys His Val Arg 1135
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Arg Tyr Arg Ala Arg Gly His Ala Leu Tyr His Gly Val Ala Val Leu 1137
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 Leu Gly Thr Leu Leu Glu Pro Thr Val Asn Lys Phe Ser Leu Arg Val
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 Ala Gly Ala Thr Ile Ile His Pro Tyr Ser Arg Ser Arg His Lys Thr
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 Thr Tyr Arg Leu Ala Ser Ala Val Val Arg Ile Ile Asn Leu Ile Gly

245 250 255
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Met Ala Met Ala Tyr Gly Ser Ser Leu Ala Ala His Gly Lys Glu Leu
45 50 55
Val Asp Lys Asn Ile Asp Arg Phe Ile Pro Ile Thr Lys Leu Lys Tyr
60 65 70
Tyr Phe Ala Val Asp Thr Met Tyr Val Gly Arg Lys Leu Gly Leu Leu
75 80 85
His Pro Fr Tyr Leu His His Asp Trp Glu Val His Tyr His His Arg
90 95 100
Thr Fr Val Ala Pro Arg His Asp Val Asn Ala Pro Asp Leu Tyr Ile
105 110 115
Pro Ala Met Ala Phe Ile Thr Tyr Val Leu Val Ala Gly Leu Ala Leu
120 125 130
Gly Thr Gln Asp Arg Phe Ser Pro Asp Leu Leu Gly Leu His Ala Ser
135 140 145
Ser Ala Leu Ala Trp Leu Thr Leu Ser Val Leu Ala Ile Leu Leu Ser
150 155 160
Leu Tyr Leu Val Thr Val Asn Thr Asp Leu Thr Thr Ile Asn Leu Val
165 170 175
Ala His Leu Gly Tyr Lys Tyr Val Gly Met Ile Gly Gly Val Leu Met
180 185 190
Gly Leu Leu His Gly Lys Ile Gly Tyr Tyr Leu Val Leu Gly Tyr Tyr
195 200 205
Tyr Val Ala Ile His Val His Met Ile Arg Thr Leu Arg Leu Lys Ile
210 215 220
Leu Ala Asp Ala Ala Ala Glu Gly Val Pro Val Arg Gly Ala Arg Asn
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 Gln Ala Arg Thr Phe Gly Ile Trp Thr Leu Leu Ser Ser Val Ile Arg
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 Cys Leu Cys Ala Ile Asp Ile His Asn Lys Thr Leu Tyr His Ile Thr
 65 70 75
 Leu Trp Thr Phe Leu Leu Ala Leu Gly His Phe Leu Ser Gln Leu Ile
 80 85 90
 Val Tyr Gly Thr Ala Ala Pro Thr Ile Gly Val Leu Ala Ile Leu Met
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 <216> PRT
 <217> Homo sapiens

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 30 35 40
 Trp Thr Leu Thr Asn Ile Ile His Asn Leu Gly Met Tyr Val Thr Leu
 45 50 55
 His Ala Val Lys Gly Thr Ser Phe Ser Thr Ser Asp Phe Gly Lys Ala
 60 65 70
 Arg Leu Leu Thr His Trp Glu Val Leu Asp Tyr Gly Val Val Thr Thr
 75 80 85
 Ser Ser Arg Lys Ile Phe Thr Ile Ser Pro Ile Ile Leu Tyr Phe Thr
 90 95 100
 Ala Ser Phe Tyr Thr Lys Tyr Asp Pro Thr His Ile Leu Leu Asn Thr
 105 110 115
 Ala Ser Leu Leu Ser Val Leu Ile Ile Lys Met Leu Val Leu His Gly
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 Val Arg Ile Phe Gly Ile Asn Lys Tyr
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<218> 98
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 3 47 4
 Pro Met Arg Arg Val Leu Arg Lys Arg Pro Ser Pro Ala Pro Arg Thr
 10 15 47
 Ile Arg Ile Glu Trp Leu Lys Ser Lys Ser Thr Lys Ala Ala Thr Lys
 65 70 75 78
 Phe Met Leu Lys Glu Lys Pro Pro Asn Glu Asn Lys Asn Asn Asn Ser
 85 90 95
 Pro Glu Ser Ser Leu Leu Pro Arg Ala Pro Ala Leu Pro Pro Pro Pro
 100 105 110
 Ser Val Ala Pro Ser Thr Gly Ala Ala Glu Trp Thr Val Pro Thr Val
 115 120 125
 Ser Lys Ser Leu Thr Pro Glu Pro Thr Glu Pro Pro Pro Lys Pro Lys
 130 135 140
 Thr Met Gly Ser Pro Val Glu Ser Thr Leu Ile Ser Glu Leu Lys Glu
 145 150 155 160
 Lys Phe Glu Lys Lys Ser Val His Asn Lys Ala Tyr Pro
 165 170

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Met Lys Gly Asp Ile Leu Leu Ile Gly Thr Leu Leu Met Asn Ala Gly
 1 5 10
 Ala Val Leu Asn Ile Lys Leu Lys Lys Lys Arg Thr Glu Gly Ile Gly
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 Arg Glu Arg Arg Glu Pro Ser Thr Lys Arg Asn Ile Arg Glu Ile Leu
 30 35 40 45
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 65 70 75

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Met Glu Leu Pro Ala Val Asn Leu Lys Val Ile Leu Leu Lys His Trp
 1 5 10
 Leu Leu Thr Thr Trp Gly Cys Ile Val Ile Ser Gly Glu Tyr Ala Trp
 15 20 25
 Ala Asn Ile Thr Ile Leu Ala Leu Gly Val Trp Ala Val Ala Arg Arg
 30 35 40
 Asp Ser Ile Asp Ala Ile Ser Met His Leu Gly Gly Ile Leu Ala Thr
 45 50 55
 Ile Ile Leu Asp Ile Val His Ile Ser Ile Ile Tyr Pro Arg Val Ser
 60 65 70 75
 Leu Thr Asp Thr Gly Arg Phe Gly Val Gly Met Ala Ile Leu Ser Leu
 80 85 90
 Leu Leu Lys Pro Leu Ser Cys Cys Phe Val Tyr His Met Tyr Arg Glu
 95 100 105
 Arg Gly Gly Glu Leu Leu Val His Thr Gly Ile Leu Gly Ser Ser Glu
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 <212> DNA
 <213> Homo sapiens

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<210> 107
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 <212> DNA
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<210> 107
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 cctctctcga tctctcagct tctctggact ttacaacata ttatacata tctgtgtgtg 190
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| ttt tta acc tta tta tta tta tta tta tta tta tta tta tta tta tta | 60 |
| Ile Ser Ser Pro Ala Val Tyr Val Leu Ser Leu Leu Glu Met Ser Lys | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt tta tta cag tta tta gta gga gga gga tta gga tta gta tta tta | 66 |
| Ile Tyr Ser Glu Leu Ile Val Arg Gly Val Leu Gly Leu Gly Val Ile | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt gga tta tta tta tta tta tta tta tta tta tta tta tta tta tta | 72 |
| Ile Gly Leu Thr Thr Leu Glu Lys Glu Val Arg Arg His Ile Gly Ala | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt tta tta tta tta tta tta tta tta tta tta tta tta tta tta tta | 78 |
| Met Val Ala Thr Met Phe Cys Trp Val Thr Ala Met Glu Phe His Leu | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt tta tta tta tta tta tta tta tta tta tta tta tta tta tta tta | 84 |
| Met Phe Tyr Cys Thr Arg Thr Leu Pro Asn Val Leu Ala Leu Ile Val | |
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| ttt tta tta gga tta tta tta tta tta tta tta tta tta tta tta tta | 90 |
| Val Leu Leu Ala Leu Ala Ala Thr Leu Arg His Glu Thr Ala Arg Ile | |
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| ttt tta tta tta tta tta tta tta tta tta tta tta tta tta tta tta | 96 |
| Ile Thr Leu Ser Ala Ile Ala Ile Ile Val Leu Asn Val Thr Lys | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt tta tta gga tta tta tta tta tta tta tta tta tta tta tta tta | 102 |
| Leu Phe Leu Gly Leu Leu Leu Leu Leu Ala Leu Gly Asn Arg Lys Val | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt gta gta gta tta tta tta tta tta tta tta tta tta tta tta tta | 108 |
| Ser Val Val Arg Ala Leu Arg His Ala Val Pro Ala Gly Ile Leu Lys | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt gga cca aag tta tta tta tta tta tta tta tta tta tta tta tta | 114 |
| Leu Gly Leu Thr Val Ala Val Asn Ser Tyr Phe Thr Asn Glu Leu Thr | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |
| ttt tta tta tta tta tta tta tta tta tta tta tta tta tta tta tta | 120 |
| Tyr Pro Glu Gly Lys Val Leu Thr Tyr Asn Thr Val Leu Asn Lys Ser | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 | |

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 Gly Gly Ser Ile His Tyr Phe Arg Val Pro Arg Glu Tyr Trp Arg Asp
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 Lys Tyr Leu Gly Glu Pro Ile Lys Ser Glu Lys Glu Ile Asn Met Glu
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 Tyr Glu Thr Ser Ile Thr Ser Ser Gly Ile Leu Ser Gly His Val His
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 Lys Lys Thr Thr Lys Ile Ala Val Ser Leu Ile Glu Tyr Tyr Thr Val
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Val Ala Trp Val Ser Ala Gin Ala Arg Asn His Thr Ile Ala Arg Arg
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 Leu Trp Asp Val Ser Cys Asp Leu Leu Gly Leu Pro Ile Asp
 305 310 315

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 +211+ 92
 +212+ 587
 +213+ Home regions

+400+ 123
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 Phe Gly

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| Ala | Ala | Ala | Ser | Ser | Gly | Leu | Arg | Ile | Val | Leu | Ala | Ser | Phe | Ala | Leu |
| | | 50 | | | | 55 | | | | | 60 | | | | |
| Ala | Leu | Leu | Leu | Pro | Val | Ile | Leu | Ala | Val | Ala | Ala | Val | Lys | Leu | Gly |
| | | 65 | | | 70 | | | | | 75 | | | | | |
| Leu | Arg | Ala | Arg | Trp | Gly | Ser | Leu | Ile | Pro | Gly | Gly | Gly | Leu | Gly | Gly |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| Pro | Trp | Val | Ala | Val | Arg | Gly | Ser | Gly | Asp | Val | Lys | Gly | Val | Leu | Ala |
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| Leu | Ala | Ile | Gly | Thr | Asn | Ala | Gly | Asp | Gly | Ala | Arg | Val | Thr | Arg | Leu |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Pro | Val | Leu | Arg | Trp | His | Arg | Arg | Arg | Gly | Val | Gly | Arg | Arg | Leu | Leu |
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| Ala | Ile | Ala | Glu | Ala | Arg | Ala | Arg | Ala | Trp | Ala | Gly | Gly | Met | Gly | Glu |
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| Pro | Arg | Ala | Arg | Leu | Val | Val | Pro | Val | Ala | Val | Ala | Ala | Thr | Gly | Val |
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| Gly | Gly | Met | Leu | Glu | Gly | Lys | Gly | Tyr | Glu | Ala | Ile | Gly | Gly | Lys | Gly |
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| Glu | Leu | Trp | Ile | Ile | Arg | Ile | Val | Val | Asn | Ala | Ala | Gly | Tyr | Ala | Leu |
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 Pro Arg His Gly Ala Pro Met Tyr Arg Tyr Ser Phe Ala Ser Leu Ser
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 Gln Val Tyr Asn Leu Thr Ser Gln Phe Phe Arg His Asp Lys Pro Val
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 Arg Asn Arg Ile Arg Arg Asp Pro Asp Asp Pro Gln Ala Thr Lys Arg
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 Leu Lys Leu Ala Met Ile Gln Gln Tyr Leu Lys Val Gln Ser Cys Gln
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 Ser Ser Ser His Ser Met Asp Gln Val Ser Leu Ser Ala Phe Gly Gln
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 Trp Thr Gln Ile Pro Gly Ala His His Ile Ile Pro Ser Gly Phe Met
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 Glu Leu Ile Pro Ala Asp His Val Ile Val Thr Val Ser Leu Gly Val
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 Leu Lys Arg Glu Tyr Thr Ser Phe Phe Arg Pro Gly Leu Pro Thr Glu
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 Lys Val Ala Ala Ile His Arg Leu Gly Ile Gly Thr Thr Asp Lys Ile
 355 360 365
 Phe Leu Glu Phe Glu Glu Pro Phe Trp Gly Pro Glu Cys Asn Ser Leu
 370 375 380
 Glu Phe Val Trp Glu Asp Glu Ala Glu Ser His Thr Leu Thr Tyr Pro
 385 390 395 400
 Pro Glu Leu Thr Tyr Arg Lys Ile Cys Gly Phe Asp Val Leu Tyr Asn
 405 410 415
 Pro Glu Arg Tyr Gly His Val Leu Ser Gly Trp Phe Cys Gly Glu Val
 420 425 430
 Ala Leu Val Met Glu Lys Cys Asp Asp Glu Ala Val Ala Glu Ile Cys
 435 440 445
 Thr Ala Met Leu Arg His Phe Thr Gly Asn Pro Asn Ile Trp Lys Pro
 450 455 460
 Arg Arg Ile Leu Arg Ser Ala Trp Gly Ser Asn Pro Tyr Ile Arg Gly
 465 470 475 480
 Ser Tyr Ser Tyr Thr Glu Val Gly Ser Ser Gly Ala Asp Val Lys Lys
 485 490 495
 Leu Ala Lys Pro Leu Pro Tyr Thr Glu Ser Ser Lys Thr Ala Pro Met
 500 505 510
 His Val Leu Phe Ser Gly Glu Ala Thr His Arg Lys Tyr Tyr Ser Thr
 515 520 525
 Thr His Gly Ala Leu Leu Ser Gly Glu Arg Glu Ala Ala Arg Leu Ile
 530 535 540
 His Met Tyr Arg Asp Leu Phe Glu Glu Gly Thr
 545 550 555

411-412

413-414

415-416

417-418: Deleted

419-420

Met Gly Ser Glu His Ser Ala Ala Ala Arg Pro Ser Ser Tyr Arg Arg
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
 Lys Ala Glu Arg Asp Arg Asp Gly Leu Leu Ala Glu Arg Glu Ser Glu
 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
 His Ala Ile Ala Glu Phe Pro Tyr Val Glu Phe Thr Gly Arg Arg Ser
 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60
 Ile Thr Tyr Leu Thr Cys Glu Gly Thr Gly Tyr Ile Ser Thr Glu His
 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80
 Val Asn Glu Leu Val Ala Leu Ile Pro His Ser Asp Glu Arg Leu Arg
 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
 Pro Glu Arg Thr Lys Glu Tyr Val Leu Leu Ser Ile Leu Leu Cys Leu
 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120
 Leu Ala Ser Gly Leu Val Val Phe Phe Leu Phe Pro His Ser Val Leu
 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140
 Val Asp Asp Arg Gly Ile Lys Val Val Lys Val Thr Phe Asn Lys Glu
 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160
 Asp Ser Leu Val Ile Leu Thr Thr Met Ala Thr Leu Lys Ile Arg Arg
 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180

[illegible]

4408-184

| | | | | | | |
|------------|------------|------------|------------|------------|----------|-----|
| atggaatctg | aaatgaggt | gggttactg | tccactctt | tgatattga | ggtttttt | 1 |
| ggatgggtg | aaagagatg | cccatggg | aggtcattg | agggatg | ggtttttt | 12 |
| atgaatgag | agagagaggt | gggcaaggcc | ctgcatggc | tcaacaggt | ggtttttt | 140 |
| gggggaagg | aatggagaa | gggtttcaac | ggatttagc | aratggggg | ggtttttt | 240 |
| aaagaggtg | acaaagcgt | ccaggggctc | aaacacagc | tggaacaggt | ggtttttt | 300 |
| atgaacatg | ctatttgaca | agcaggaaac | gaagcagaga | agcttggtc | ggtttttt | 360 |
| aaagctggtg | gagagjccg | gaaggagga | gacaaaggc | tcaagggtt | ggtttttt | 420 |
| gttcaacag | ctgggaagg | agagagaaa | cttggccaa | ggttcaacg | ggtttttt | 480 |
| caggttggaa | aggaagtgg | gaagcttgc | caaggtgccc | accatgctg | ggtttttt | 540 |
| gggaaggag | tgagagaatg | tcataatgg | gtcaaccaag | ccagcaagc | ggtttttt | 600 |
| ctgtgaatg | ccaaacatg | aggggatct | tccagccatc | aaggagggg | ggtttttt | 660 |
| cggttagct | ctgggcctc | ggtcaacag | cttttcacac | accttcctg | ggtttttt | 720 |
| aggttagca | acacacatg | c | | | ggtttttt | 741 |

4210-185

4211-185

4212-DNA

4213-Hemo. sapiens

4409-184

| | | | | | | |
|------------|------------|------------|------------|------------|----------|-----|
| atggaatctg | aaatgaggt | gggttactg | tccactctt | tgatattga | ggtttttt | 1 |
| ggatgggtg | aaagagatg | cccatggg | aggtcattg | agggatg | ggtttttt | 12 |
| atgaatgag | agagagaggt | gggcaaggcc | ctgcatggc | tcaacaggt | ggtttttt | 140 |
| gggggaagg | aatggagaa | gggtttcaac | ggatttagc | aratggggg | ggtttttt | 240 |
| aaagaggtg | acaaagcgt | ccaggggctc | aaacacagc | tggaacaggt | ggtttttt | 300 |
| atgaacatg | ctatttgaca | agcaggaaac | gaagcagaga | agcttggtc | ggtttttt | 360 |
| aaagctggtg | gagagjccg | gaaggagga | gacaaaggc | tcaagggtt | ggtttttt | 420 |
| gttcaacag | ctgggaagg | agagagaaa | cttggccaa | ggttcaacg | ggtttttt | 480 |
| caggttggaa | aggaagtgg | gaagcttgc | caaggtgccc | accatgctg | ggtttttt | 540 |
| gggaaggag | tgagagaatg | tcataatgg | gtcaaccaag | ccagcaagc | ggtttttt | 600 |
| ctgtgaatg | ccaaacatg | aggggatct | tccagccatc | aaggagggg | ggtttttt | 660 |
| cggttagct | ctgggcctc | ggtcaacag | cttttcacac | accttcctg | ggtttttt | 720 |
| aggttagca | acacacatg | c | | | ggtttttt | 741 |

4210-184

4211-184

4212-DNA

4213-Hemo. sapiens

4410-184

| | | | | | | |
|------------|------------|------------|------------|------------|----------|-----|
| atggaatctg | aaatgaggt | gggttactg | tccactctt | tgatattga | ggtttttt | 1 |
| ggatgggtg | aaagagatg | cccatggg | aggtcattg | agggatg | ggtttttt | 12 |
| atgaatgag | agagagaggt | gggcaaggcc | ctgcatggc | tcaacaggt | ggtttttt | 140 |
| gggggaagg | aatggagaa | gggtttcaac | ggatttagc | aratggggg | ggtttttt | 240 |
| aaagaggtg | acaaagcgt | ccaggggctc | aaacacagc | tggaacaggt | ggtttttt | 300 |
| atgaacatg | ctatttgaca | agcaggaaac | gaagcagaga | agcttggtc | ggtttttt | 360 |
| aaagctggtg | gagagjccg | gaaggagga | gacaaaggc | tcaagggtt | ggtttttt | 420 |
| gttcaacag | ctgggaagg | agagagaaa | cttggccaa | ggttcaacg | ggtttttt | 480 |
| caggttggaa | aggaagtgg | gaagcttgc | caaggtgccc | accatgctg | ggtttttt | 540 |
| gggaaggag | tgagagaatg | tcataatgg | gtcaaccaag | ccagcaagc | ggtttttt | 600 |
| ctgtgaatg | ccaaacatg | aggggatct | tccagccatc | aaggagggg | ggtttttt | 660 |
| cggttagct | ctgggcctc | ggtcaacag | cttttcacac | accttcctg | ggtttttt | 720 |
| aggttagca | acacacatg | c | | | ggtttttt | 741 |

<211> 790
 <211> tRNA
 <211> Homo sapiens

<478> 139
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 aacagggaac gtttgttggc tgaacgagag cagggaagag ccaattgctc gttccatct 120
 gtaaatcca ctttgadaga tagcatcacc ttctctcagt gccaggggag aggtatctt 180
 caaacagc agttaaata gtttgttggc ttgatccac accgtgat aggtatttt 240
 ccttag gaa cttaagcaata ttgctctctg tccatctgc ttttgtctct agcatctct 300
 ttggtggttt tcttctgtt tccgcattca gtccttgggt atgatgacg gttcaaaagg 360
 gtgaaagtt catttaataa gcaagaactc attgtaatto tcccatcat ggtctctt 420
 aaaaacagga atcccaactt ctacacgggt gtagtgacca gctgtgctag ccagattcag 480
 taatgaaa cagtggtcag tacatatgt gttatcaag tctcctctt tcaatcttt 540
 agtgaagaa cttgtaatt taagggaag gcggagagg gaggacggt tctctcttt 600
 taattctct gaaagttacc tgagatctct gtcacaca tagtgatct cttggtttt 660
 tttcttga tttcttact tggctcat gttcaagat cttggagat ttttcttt 720
 gttttcttt ttgtaattt caagctatt 780

<212> 141
 <212> 141
 <212> tRNA
 <212> Homo sapiens

<479> 141
 atgaaatca cagatctag ggaacagaa aggtgggtt cagccatga taaagtttt 60
 tcttctctt ctttgaaga tatcatttt ttttcttaa atcctcttt ttttctttt 120
 ttttctttt ttttcttaa ccaagttcca gtttgttga aggtgcttt ttttctttt 180
 ttttctttt ttttcttaa cagtgatctt atcctgtga aggttcttt ttttctttt 240
 ttttctttt ttttcttaa gtagctttt atcctgtga aggttcttt ttttctttt 300
 gagctgtgt gttttaa ag gtagctttt atcctgtga aggttcttt ttttctttt 360
 gtagctgtg agtaggtgt gtagctgtt agtagctga tcccatgat tagtagctgt 420
 atttagctt tagtagctga atttagctga tttttttt ttttcttaa gtttagctgt 480
 atttagctt gtagctga atttagctga tttttttt ttttcttaa gtttagctgt 540

<213> 141
 <213> 141
 <213> tRNA
 <213> Homo sapiens

<214>
 <214> tRNA
 <214> tRNA ... 214

<480> 141
 atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt 60
 atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt 120
 atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt 180
 Met Thr Thr Trp Ser Leu Arg Arg Arg His Ala Arg Thr Leu 240
 1 5 10
 gga cta tta tta cta gaa gaa tta gga tta tta gta tta tta gga cta 300
 Gly Leu Leu Leu Leu Val Leu Gly Phe Leu Val Leu Arg Arg Leu 360
 15 20 25 30
 gaa tta gaa gaa tta gaa gaa tta gaa tta gaa gaa tta gaa tta gaa 420
 Asp Trp Phe Thr Leu Val Pro Leu Arg Leu Arg His Arg Gln Leu Gly 480
 35 40 45
 atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt 540
 Leu His Ala Lys Gly Trp Asn Phe Met Leu Gln Arg Ser Thr Phe Trp 600
 50 55 60
 atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt atcctctctt 660
 Leu His Gly Gly Leu Ile His Tyr Phe Arg Val Pro Arg His Tyr Trp 720
 65 70 75

| 85 | 90 | 95 | |
|---|-----|-----|-----|
| arg gac ggc ctc ctg aag atg aad ggc tgc agc ttc aac aac gtc aac | | | 410 |
| Arg Asp Arg Leu Leu Lys Met Lys Ala Cys Gly Leu Asn Thr Leu Thr | | | |
| 85 | 85 | 85 | |
| ala tat gtc cag tgg aac ctg cat gag gaa aac aac aac ttc ttc | | | 415 |
| Thr Tyr Val Pro Trp Asn Leu His Glu Pro Glu Arg Gly Lys Phe Asp | | | |
| 95 | 100 | 105 | |
| tta tat ggg aac ctg gag ctg gag ggc tta gtc ctg atg ggc aca gag | | | 420 |
| Phe Ser Gly Asn Leu Asp Leu Glu Ala Phe Val Leu Met Ala Ala Glu | | | |
| 115 | 120 | 125 | |
| atc ggg ctg tgg gtc att ctg cgt cca ggc ccc tat atc ttc agt gag | | | 425 |
| Ile Gly Leu Trp Val Ile Leu Arg Pro Gly Pro Tyr Ile Cys Ser Glu | | | |
| 130 | 135 | 140 | |
| atg gac ctg ggg ggc ttc ccc agc tgg cta ctc cca gac cgt ggc atc | | | 430 |
| Met Asp Leu Gly Gly Leu Pro Ser Trp Leu Leu Glu Asp Pro Gly Met | | | |
| 145 | 150 | 155 | |
| aug cta agc aca act tac aag ggc ttc aac gaa gaa gtc gag ctt tat | | | 435 |
| Arg Leu Asn Thr Thr Tyr Lys Gly Phe Thr Glu Ala Val Asp Leu Tyr | | | |
| 160 | 165 | 170 | |
| tat gac gac cag atg ttc agc gtc gta cca cta cag tat aac agt gag | | | 440 |
| Phe Asp His Leu Met Ser Arg Val Val Pro Leu Glu Tyr Lys Arg Gly | | | |
| 175 | 180 | 185 | |
| gga tat atc att ttc gta aac gta gag aac aac tat ttc ttc aac | | | 445 |
| Gly Pro Ile Ile Ala Val Glu Val Glu Asn Glu Tyr Gly Ser Tyr Asn | | | |
| 195 | 200 | 205 | |
| aaa gac tat gaa tac atg cta tac gta aac gag gta ttc gac tat tat | | | 450 |
| Lys Asp Pro Ala Tyr Met Pro Tyr Val Lys Lys Ala Leu Glu Asp Arg | | | |
| 210 | 215 | 220 | |
| atc att ctg aac ctg ctc ctg act tca gag tat aac gta gta gta atc | | | 455 |
| Gly Ile Val Glu Leu Leu Leu Thr Ser Asp Asn Lys Asp Gly Leu Ser | | | |
| 225 | 230 | 235 | |
| aag ggc att gta cag gga gtc ttg ggc aac atc aac ttg cag cca aca | | | 460 |
| Lys Gly Ile Val Glu Gly Val Leu Ala Thr Ile Asn Leu Glu Ser Thr | | | |
| 240 | 245 | 250 | |
| cac gag ctg cag cta ctg aac aac ttc cta ttc aac gta tat ttc aac | | | 465 |
| His Glu Leu Glu Leu Leu Thr Thr Phe Leu Ile Asn Val Ser Gly Thr | | | |
| 255 | 260 | 265 | |
| gag ccc gag atc ctg atg gag tac tgg aac ggc ttg tta tat tat tat | | | 470 |
| Glu Pro Lys Met Val Met Glu Tyr Trp Trp Gly Trp Phe Arg Leu Trp | | | |
| 275 | 280 | 285 | |
| gga tat att gaa act aac ttg gat tat ttc tat tat tat tat tat tat | | | 475 |
| Gly Gly Pro His Asn Ile Leu Asp Ser Ser Glu Val Leu Lys Thr Val | | | |
| 290 | 295 | 300 | |
| tat gac atc gta gag ggc agc ttc ttc aac tat tat tat tat tat tat | | | 480 |
| Ser Ala Ile Val Asp Ala Gly Ser Ser Ile Asn Leu Tyr Met Phe His | | | |
| 305 | 310 | 315 | |
| gga gta att aac ttc gga ttc atc tat gta tat atc tat tat tat tat | | | 485 |
| Gly Gly Thr Asn Phe Gly Phe Met Asn Gly Ala Met His Ile His Arg | | | |
| 320 | 325 | 330 | |
| tac aag tca gat gta aac agc tat gat tat tat tat tat tat tat tat | | | 490 |
| Tyr Lys Ser Asp Val Thr Ser Tyr Asp Tyr Asp Ala Val Leu Thr Glu | | | |
| 335 | 340 | 345 | |
| gac gga gat tac aac ggc aag tac atg aag ctt cga gac ctc ttc gtc | | | 495 |
| Ala Gly Asp Tyr Thr Ala Lys Tyr Met Lys Leu Arg Asp Phe Phe Gly | | | |
| 355 | 360 | 365 | |
| tac atc tca gag atc ctt ctc cct ccc cca cct gac ctc ctg cct aag | | | 500 |
| Ser Ile Ser Gly Ile Pro Leu Pro Pro Pro Pro Asp Leu Leu Pro Lys | | | |
| 370 | 375 | 380 | |
| atg cta tat tat tat tta aac cca atc ttg tta tat tat tat tat tat | | | 505 |
| Met Pro Tyr Glu Pro Lys Thr Pro Val Leu Tyr Leu Ser Leu Thr Asp | | | |
| 385 | 390 | 395 | |

| | | | |
|---|-----|-----|-----|
| 95 | 100 | 105 | |
| gag gtc ttc ggt ctg ggc gct ggc aca aat gca tgg gac ggg gac gac | | | 447 |
| Gly Val Leu Ala Leu Ala Pro Gly Thr Asn Ala Gly Asp Gly Ala Arg | | | |
| 110 | 115 | 120 | |
| gtc acc ggc atg tct gtc tct ggc tgg cac ggc ggc ggg ggc tgg tgg ggc | | | 448 |
| Val Thr Arg Leu Ser Val Ser Arg Trp His Arg Arg Arg Gly Val Gly | | | |
| 125 | 130 | 135 | 14 |
| agg agg ctg tta acc ttc ggc gag ggc ggc ggc ggc tgg tgg ggc tgg tgg | | | 449 |
| Arg Arg Leu Leu Ala Phe Ala Glu Ala Arg Ala Arg Ala Trp Ala Gly | | | |
| 145 | 150 | 155 | |
| ggc atg ggg gag gcc ggc ggc ggc ggc ggc ggc ggc ggc ggc ggc ggc ggc | | | 450 |
| Gly Met Gly Glu Pro Arg Ala Arg Leu Val Val Pro Val Ala Val Ala | | | |
| 160 | 165 | 170 | |
| gac tgg ggg ctg gga ggg atg ctg gag ggc tct ggc taa caa gac gac | | | 451 |
| Ala Trp Gly Val Gly Gly Met Leu Glu Gly Cys Gly Tyr Glu Ala Glu | | | |
| 175 | 180 | 185 | |
| gga gac ttt ggc taa ctg ggc taa acc atg gtc gtc agg gaa ttc ggc gaa | | | 452 |
| Gly Gly Trp Gly Cys Leu Gly Tyr Thr Leu Val Arg Glu Phe Ser Cys | | | |
| 190 | 195 | 200 | |
| gac ctg tggagttaca gctgacac caggacagg gaggaagg ggggaggg | | | 453 |
| Asp Leu | | | |
| 205 | | | |
| caactatgca cctcctactg tttgaggttt ctttaactg cctcctcctt gggat ttt | | | 454 |
| caacagcttg gttttagaaa tagagggttg ctgaggggag gacttgat tttttttaa | | | 455 |
| gcttataat ggaagttat tttgttttga gtttttata ttgtatt tttttttt | | | 456 |
| tcttggttt ttttggtttt ttgaggttgg ctttttcaaa cctcctcctt cctcctcctt | | | 457 |
| ttctttagaa actttctctg ttcttctctg caaaattgtt gctgttctga cctcctcctt | | | 458 |
| ggatctctt ctggttagga ggaagagag ctgagtaga tttttttaa tttttttt | | | 459 |
| ttgtatt cctcctcctt ttctttaggtt gttttttt ttgtatt ttgtatt ttgtatt | | | 460 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 461 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 462 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 463 |
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| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 465 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 466 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 467 |
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| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 469 |
| ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt ttgtatt | | | 470 |

<211> 146
 <211> 1922
 <212> DNA
 <213> H. v. sapiens

<220>
 <221> CDS
 <222> (115...1416)

| | | |
|---|-----|-----|
| 4700 | 146 | |
| ctcctcctga cctcctcctga cctcctcctga cctcctcctga cctcctcctga cctcctcctga | | 471 |
| gagagagag cctcctcctga cctcctcctga cctcctcctga cctcctcctga cctcctcctga | | 472 |
| atg gac gac gac gac gac gac gac gac gac gac gac gac gac gac gac gac | | 473 |
| Met Asp Ala Arg Trp Trp Ala Val Val Val Leu Ala Ala Arg Arg Arg | | |
| 1 | 2 | 3 |
| gta gga gaa ggt ggg gaa ggt ggc gaa ggt ggc gaa ggt ggc gaa ggt ggc | | 474 |
| Leu Gly Ala Gly Gly Glu Thr Pro Glu Ala Pro Pro Glu Ser Thr Thr | | |
| 21 | 22 | 23 |
| gag gta tgg ttc ttc gga ttt gtc gtc gaa ggt ggt ggc gaa ggt ggc | | 475 |
| Gln Leu Trp Phe Phe Arg Phe Val Val Asn Ala Ala Gly Tyr Ala Ser | | |
| 35 | 40 | 45 |
| tta atg gta ggt ggc taa ctg ctg gtc gaa ggt ggt ggc gaa ggt ggc | | 476 |
| Phe Met Val Pro Gly Tyr Leu Leu Val Glu Tyr Phe Arg Arg Lys Asn | | |
| 50 | 55 | 60 |
| gac atg gag aat ggt agg ggc ggc ggc ggc ggc ggc ggc ggc ggc ggc ggc | | 477 |
| Tyr Leu Glu Thr Gly Arg Gly Leu Cys Phe Arg Leu Val Tyr Ala Tyr | | |
| 65 | 70 | 75 |
| gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt | | 478 |
| gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt gta ttt | | |

| | |
|---|-----|
| Val Phe Gly Asn Glu Pro Lys Ala Ser Asp Glu Val Pro Leu Ala Pro | |
| 85 90 95 | |
| aga aga gag gag gaa gag aga aga gag aga tgg gag gaa atg aag ata | 413 |
| Arg Thr Glu Ala Ala Glu Thr Thr Pro Met Trp Gln Ala Leu Lys Leu | |
| 100 105 110 | |
| ctc ttc tct gac aca ggg ctc gag gtg tct tat ctg aat ggg ggt gta | 414 |
| Leu Phe Cys Ala Thr Gly Leu Gln Val Ser Tyr Leu Thr Trp Gly Val | |
| 115 120 125 | |
| ata gag gaa aga gtg atg acc agc agt tat ggg gaa aca gaa aca tca | 415 |
| Leu Gln Glu Arg Val Met Thr Arg Ser Tyr Gly Ala Thr Ala Thr Ser | |
| 130 135 140 | |
| ccg gat gag ggc ttt aag gac tgg gag ttc ctg gtg ata atg aac aga | 416 |
| Pro Gly Glu Arg Phe Thr Asp Ser Gln Phe Leu Val Leu Met Asn Arg | |
| 145 150 155 | |
| gtg ctg gaa atg att gtc gct ggc ctc tcc tgt gtt ctc tgc aag aat | 417 |
| Val Leu Ala Leu Ile Val Ala Gly Leu Ser Cys Val Leu Cys Lys Gln | |
| 160 165 170 175 | |
| acc gag gat gaa gaa gaa atg gat cgg tat tcc ttt gaa agt ata tca | 418 |
| Pro Arg His Gly Ala Pro Met Tyr Arg Tyr Ser Phe Ala Ser Leu Ser | |
| 180 185 190 | |
| aat gta atg ata agc tgg tgc caa taa caa gct gtt aag ttc ctg aat | 419 |
| Asn Val Leu Ser Ser Trp Cys Gln Tyr Gln Ala Leu Lys Phe Val Ser | |
| 195 200 205 | |
| ttc ctt att gag gtc ctg gaa aac gaa tat aag atg ata tca gta ata | 420 |
| Phe Pro Thr Gln Val Leu Ala Lys Ala Ser Lys Val Ile Phe Val Met | |
| 210 215 220 | |
| ata ata gaa ata att atg tct cgg cgc aat ttc aca aca tgc aat tca | 421 |
| Leu Met Gly Lys Leu Val Ser Arg Arg Ser Tyr Gln His Trp Gln Tyr | |
| 225 230 235 | |
| ctg aca gat aca ttc atc tcc att ggg gta aat atg ttt ata tca tca | 422 |
| Leu Thr Ala Thr Leu Ile Ser Ile Gly Val Ser Met Phe Leu Leu Ser | |
| 240 245 250 | |
| aga gga gaa gag aac agc agc agc taa caa gaa acc aca ctc tca ggt ata | 423 |
| Ser Gly Pro Glu Pro Arg Ser Ser Pro Ala Thr Thr Leu Ser Gly Leu | |
| 255 260 265 | |
| ata ata atg gaa ggt tat att gct ttc gaa aga ttc aca tca aac tgc | 424 |
| Ile Leu Leu Ala Gly Tyr Ile Ala Phe Asp Ser Phe Thr Ser Asn Trp | |
| 270 275 280 285 | |
| caa gat gaa gaa ttc gaa gat aat aat tca tgg atg gag ata ata tca | 425 |
| Gln Arg Ala Leu Phe Ala Tyr Lys Met Ser Ser Val Gln Met Met Phe | |
| 290 295 300 | |
| ggt gta att tca ttc tcc tgc ctc ttc aca atg agc tca tca tca tca | 426 |
| Gly Val Asn Phe Phe Ser Cys Leu Phe Thr Val Gly Ser Leu Leu Gln | |
| 305 310 315 | |
| caa gag gaa gaa gag gga aac agc ttc arg atg aga gaa gaa gaa gaa | 427 |
| Gln Gly Ala Leu Leu Ala Gly Thr Arg Phe Met Gly Arg His Ser Gln | |
| 320 325 330 | |
| ttc att gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa | 428 |
| Phe Ala Ala His Ala Leu Leu Leu Ser Ile Cys Ser Ala Tyr Gly Gln | |
| 335 340 345 | |
| cta ttc atc ttc ttc aac att ggg gag ttc agg gct gaa gaa gaa gaa | 429 |
| Leu Phe Ile Phe Tyr Thr Ile Gly Gln Phe Gly Ala Val Phe Thr | |
| 350 355 360 | |
| ata ata atg aac atc agc aac gaa ttc gaa ttc att att tca tca tca | 430 |
| Ile Ile Met Thr Leu Arg Gln Ala Phe Ala Ile Leu Leu Ser Cys Leu | |
| 365 370 375 | |
| cta tat ggc gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa gaa | 431 |
| Leu Tyr Gly His Thr Val Thr Val Val Gly Gly Leu Gly Val Ala Val | |
| 380 385 390 | |
| cta ttc att att att att att att att att att att att att att att | 432 |
| Val Phe Ala Ala Leu Leu Leu Leu Arg Val Tyr Ala Arg Gly Arg Leu Lys | |

405 410 415 1418
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 Met Gly His Arg Thr Leu Val Leu Pro Tyr Val Leu
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 ctg acc ttg tgt gtc act ggc ggg acc agc gag gta tgg att caa gtt
 Leu Thr Leu Cys Val Thr Ala Gly Thr Pro Glu Val Tyr Val Glu Val
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 Arg Met Glu Ala Thr Glu Leu Ser Ser Phe Thr Ile Arg Cys Gly Phe
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 Leu Gly Ser Gly Ser Ile Ser Leu Val Thr Val Ser Tyr Gly Gly Ile
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 Asp Gly Ala Gly Gly Thr Thr Leu Ala Val Leu His Leu Glu Arg Gly
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 Ile Arg Glu Tyr Ala Pro Ala Arg Glu Ala Arg Tyr Glu Thr Glu Ser
 44 46 48
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 Ser Ile Ser Leu Ile Leu Glu Gly Ser Gly Ala Ser Ser Tyr Tyr Ala
 51 53 55
 aat aat att ttc tgt tgt aag ttt ttt ttt ttt ttt gaa gtt ttt ttt
 Asn Thr Thr Ile Cys Cys Lys Ile Ala Ser Phe Phe His Gly Ser Tyr
 58 60 62
 gag gcc tct ggg agc ctg cgg gcc agc tca gac caa tgg ctg tct gcc
 Glu Ala Cys Gly Ser Leu Pro Pro Ser Ser Asp Pro Gly Leu Ser Ala
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 Pro Pro Thr Pro Ala Pro Ile Leu Arg Ala Asp Leu Ala Gly Ile Leu
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 Gly Val Ser Gly Val Leu Leu Ile Gly Tyr Val Tyr Leu Leu His Leu
 79 81 83
 att att att att att att att att att att att att att att att att

| | | | | |
|---|-----|-----|-----|------|
| 75 | 80 | 85 | 90 | |
| cat cta gca aca gac aac gac cta cta gaa aat aca aac aat gag aat | | | | 541 |
| His Leu Ala Ala Ala Asn Gly Leu Leu Glu Thr Thr Asp Gly Ala | | | | |
| 95 | 100 | 105 | | |
| agg aga gta ggc agc atc agc cta tat tta aag aat ggt tta ggt tta | | | | 542 |
| Arg Ser Val Gly Arg Ile Ser Leu Tyr Ser Lys Asn Gly Val Ala Cys | | | | |
| 110 | 115 | 120 | | |
| tac ctt acc aac cac ggc cgc agg atc ccc aag gac gta gtt gag aat | | | | 617 |
| Tyr Leu Thr Asn His Gly Arg Arg Ile Pro Lys Asp Val Val Glu Ala | | | | |
| 125 | 130 | 135 | | |
| ttc ayc gat tta taa aac gag gtc tat aac ttg aac caa gag tta tta | | | | 618 |
| Phe Ser Asp Leu Tyr Asn Glu Val Tyr Asn Leu Thr Gln Glu Phe Phe | | | | |
| 140 | 145 | 150 | | |
| egg cac gat aca cca gtc aat gct aac agt aac aat agt gag ggt tta | | | | 712 |
| Arg His Asp Lys Pro Val Asn Ala Glu Ser Gln Asn Ser Val Gly Val | | | | |
| 155 | 160 | 165 | 170 | |
| ttc aat tta gag gac tta tat aac agc atc agg aat gac aat aat aat | | | | 741 |
| Phe Thr Arg Ala Glu Val Arg Asn Arg Ile Arg Asn Asp Pro Asp Arg | | | | |
| 175 | 180 | 185 | | |
| caa gag aat aat aat ggc gta gag gta gta gta gta gta gta gta gta | | | | 742 |
| Pro Glu Ala Thr Lys Arg Leu Lys Leu Ala Met Ile Gln Gln Tyr Leu | | | | |
| 190 | 195 | 200 | | |
| aag gta gat tta tta tta gag aat aat tta tta aat aat aat aat aat | | | | 743 |
| Lys Val Ala Ser Cys Glu Ser Ser Ser His Ser Met Asp Ala Val Ser | | | | |
| 205 | 210 | 215 | | |
| tta aat aat tta tta tta gag aat aat aat aat aat aat aat aat aat | | | | 744 |
| Leu Ser Ala Phe Gly Ala Tyr Thr Glu Ile Pro Gly Ala His His Ile | | | | |
| 220 | 225 | 230 | | |
| atc aat tta tta tta aat aat aat aat aat aat aat aat aat aat aat | | | | 745 |
| Ile Pro Ser Gly Ile Met Arg Val Val Glu Leu Leu Ala Ala Gly Ile | | | | |
| 235 | 240 | 245 | 250 | |
| cat gat aat gta atc gag cta ggc aac cat gta cca tga att aat tta | | | | 1041 |
| Pro Ala His Val Ile Gln Leu Gly Lys Pro Val Arg Cys Ile His Trp | | | | |
| 255 | 260 | 265 | | |
| gac gag aat tta ggc ggc ggc aac ggc ggc cat gag aat gag aat aat | | | | 1042 |
| Asp Gln Ala Ser Ala Arg Pro Arg Gly Pro Glu Ile Glu Pro Arg Gly | | | | |
| 270 | 275 | 280 | | |
| gag gag aat tta aat aat aat aat aat aat aat aat aat aat aat aat | | | | 1043 |
| Ala Gly Asp His Asn His Asp Thr Gly Glu Gly Gly Gln Gly Gly Ala | | | | |
| 285 | 290 | 295 | | |
| gag gat gag aat tta gag ggc aat aat gag gag aat gag aat aat aat | | | | 1141 |
| Ala Phe Arg Gly Gly Arg Trp Asp Glu Asp Glu Gln Trp Pro Val Val | | | | |
| 300 | 305 | 310 | | |
| gag gag gag aat tta gag ggc aat aat gag gag aat gag aat aat aat | | | | 1142 |
| Val Gln Tyr Glu Asp Cys Glu Leu Ile Pro Ala Asp His Val Ile Val | | | | |
| 315 | 320 | 325 | 330 | |
| atc gta tta tta aat gta gta aat aat gag aat aat aat aat aat aat | | | | 1143 |
| Thr Val Ser Leu Gly Val Leu Lys Arg Gln Tyr Thr Ser Thr Thr Arg | | | | |
| 335 | 340 | 345 | | |
| caa ggc gta tta aat gag aat gta tta tta aat aat aat aat aat aat | | | | 1144 |
| Pro Gly Leu Pro Thr Glu Lys Val Ala Ala Ile His Arg Leu Gly Ile | | | | |
| 350 | 355 | 360 | | |
| ggc aac aat aat aat aat aat tta cta gaa tta gag gag aat tta gag | | | | 1145 |
| Gly Thr Thr Asp Lys Ile Phe Leu Glu Phe Glu Glu Pro Phe Trp Gly | | | | |
| 365 | 370 | 375 | | |
| cat gag tta aat aat cta gag tta gta tga gag aat aat aat aat aat | | | | 1146 |
| Pro Glu Cys Asn Ser Leu Gln Phe Val Trp Glu Asp Glu Ala Glu Ser | | | | |
| 380 | 385 | 390 | | |
| cat aat aat aat aat aat aat aat aat aat aat aat aat aat aat | | | | 1147 |
| His Thr Leu Thr Tyr Pro Pro Glu Leu Trp Tyr Arg Lys Ile Cys Gly | | | | |
| 395 | 400 | 405 | | |

ttt gat gtc atc tac cag cct gag ctt tac ggc cat gta ctg agc gtt 1481
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 Trp Ile Cys Gly Glu Glu Ala Leu Val Met Glu Lys Cys Asp Asp Glu
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 Asn Pro Tyr Phe Arg Gly Ser Tyr Ser Tyr Thr Gln Val Gly Ser Ser
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 Gly Ala Asp Val Glu Lys Leu Ala Lys Pro Leu Pro Tyr Thr Glu Ser
 495 500 505
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 Ser Lys Thr Ala Pro Met Gln Val Leu Phe Ser Gly Gln Ala Thr His
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 Arg Lys Tyr Tyr Ser Thr Thr His Gly Ala Leu Leu Ser Gly Gln Arg
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 Met Gly Ser Gln His Ser Ala
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 Ala Ala Arg Pro Ser Ser Cys Arg Arg Lys Gln Glu Asp Asp Arg Asp
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 Gly Leu Leu Ala Glu Arg Glu Gln Glu Glu Ala Ile Ala Gln Phe Pro
 25 30 35
 tat gta gaa ttc aat gaa aga gat agt atc ttc tgt cta gtt tgc cca 257
 Tyr Val Ala Phe Thr Gly Arg Asp Ser Ile Thr Cys Leu Thr Tyr Gln
 40 45 50 55
 ggt aca ttc tcc att cca ttc gag tta tta tta tta tta tta tta tta
 Gly Thr Gly Tyr Ile Pro Thr Ala Gln Val Asn His Leu Val Ala Leu

